

## NIA Project Registration and PEA Document

### Date of Submission

Jan 2014

### Project Reference Number

NIA\_NGET0083

## Project Registration

### Project Title

Cable Oil Regeneration

### Project Reference Number

NIA\_NGET0083

### Project Licensee(s)

National Grid Electricity Transmission

### Project Start

April 2013

### Project Duration

4 years and 4 months

### Nominated Project Contact(s)

Martin Wilson

### Project Budget

£1,071,000.00

## Summary

Following recent research it is believed that 98% of cable oil can be recycled and re introduced into the cables. An oil regeneration plant can regenerate the cable oil on site and reintroduced the oil back into the cables without the added costs and associated risks. Presently the UK has only one cable oil manufacturer thus making the availability of this oil a high risk and possibly leading to a high cost. There has been a recent increase in cost of cable oil due to the availability of the raw product from abroad.

### Nominated Contact Email Address(es)

box.NG.ETInnovation@nationalgrid.com

## Problem Being Solved

Since the first introduction of oil filled cables, manufactures have always insisted that all cable oil removed from oil filled cable, both new and old was discarded to 'waste'. Due to pressures from environmental legislation, the waste oil is normally sent for recycling into other products or disposed at a high cost.

## Method(s)

This project proposes the following method:

- Review current best practices in oil regeneration from other asset areas (internal review)
- Approach supplier for development of an oil regeneration system
- Development of specific critical components
- Delivery of cable oil regeneration plant
- Trials and testing

## Scope

Following recent research it is believed that 98% of cable oil can be recycled and re introduced into the cables. An oil regeneration plant can regenerate the cable oil on site and reintroduced the oil back into the cables without the added costs and associated risks. Presently the UK has only one cable oil manufacturer thus making the availability of this oil a high risk and possibly leading to a high cost. There has been a recent increase in cost of cable oil due to the availability of the raw product from abroad.

### Objective(s)

This project will provide an on site service which will give the asset owner of all oil filled cables the option of purifying and re using any oil extract from cables during maintenance and repairs. Thus removing the need to dispose of large quantities of waste oil.

### Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

### Success Criteria

The chances of this proposed are high – The flushing of an existing circuit has illustrated that it is perfectly plausible to re-generate oil, although we do not believe this has been trialed successfully yet.

### Project Partners and External Funding

n/a

### Potential for New Learning

n/a

### Scale of Project

This project is focused on an oil filled cable problem specifically; these cables are found extensively throughout the GB transmission system, mainly in London and in built up areas.

Potential applications at DNO level are for the same oil filled cables. We have been approached by WPD to investigate this project further with them during the initial scoping the project by National Grid.

### Technology Readiness at Start

TRL4 Bench Scale Research

### Technology Readiness at End

TRL8 Active Commissioning

### Geographical Area

This project will deliver tools and techniques for use on the whole of the UK Transmission network (national) where oil filled cables are present.

### Revenue Allowed for the RIIO Settlement

None

### Indicative Total NIA Project Expenditure

NGET NIA project expenditure is £1,071,000

## 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)

This project has the potential to deliver net financial benefits to customers due to the significant reduction of waste oil.

Currently, National Grid has to pay to obtain oil that goes into the cable that meets the required IEC standard. We then have to pay for the disposal of that oil when the cable route is flushed or decommissioned.

#### Please provide a calculation of the expected benefits the Solution

Base cost:

£1.59/litre to buy new

£0.70/litre to dispose

Total = £2.29/litre currently

Method cost:

No need to buy new

£0.07/litre to dispose of waste

Total = £0.07/litre projected

Therefore  $2.29 - 0.07 = £2.22/l$  saving.

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

This system is very replicable across GB. Virtually no modification should be needed to effectively re-generate oil for use in cable systems.

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

It is envisaged that for the National Grid system, this one project would be sufficient to re-generate the oil in the cables.

We do not have visibility of the amount of cables in the ground for other network licensees, or their maintenance policies or their fault levels & leakage amounts.

## 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 are able to use this piece of equipment that is being developed if they have oil filled cables on their system.

**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