



Innovation Funding Incentive

For

Sustainable Development

(IFI/SD)

Report

Northern Gas Networks

For Period 1st April 2008 to 31st March 2009

July 2009

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1. Executive Summary

During the period 1st April 2008 to 31st March 2009, Northern Gas Networks Limited (NGN) has contributed towards a total of eight innovative projects. Of these five projects were collaborative with NGN being the sponsoring Gas Distribution Network (GDN) for two of these projects; NGN also had three internal projects. NGN's total allowable expenditure for the reporting period from 1st April 2008 to 31st March 2009 was £115,693. 80% of this, £92,554, is recoverable through the Innovation Funding Incentive (IFI).

Wherever practicable, NGN sponsored collaborative research and development with other organisations through the Gas Networks Collaboration Forum who share common objectives as well as maximising the benefit of IFI/SD money for end consumers through working with the other GDNs – National Grid, Scotia Gas Networks and Wales & West Utilities.

The 8 IFI/SD projects are:

| Project | Project Details | | | NGN 2008/2009 Costs (80% of these are recoverable) | | |
|---|---|-----------------|-------------|--|---------------------|------------------|
| | Collaborative / Internal | Project total £ | NGN total £ | NGN External cost £ | NGN Internal cost £ | NGN total cost £ |
| Alternative Inspection Technique For Buried Pipelines | Collaborative Sponsor - National Grid | 109,090 | 12,361 | 2,560 | 0 | 2,560 |
| Nozzle Weld Materials Testing | Collaborative Sponsor - NGN | 79,800 | 23,700 | 18,700 | 5,000 | 23,700 |
| Pipeline Fatigue Revalidation | Internal | 36,200 | 36,200 | 22,200 | 14,000 | 36,200 |
| In-Line Inspection Dent Assessment | Collaborative Sponsor - NGN | 21,505 | 7,480 | 4,675 | 2,805 | 7,480 |
| Improvements to Emergency Call Handling | Collaborative Sponsor - Scotia Gas Networks | 52,000 | 6,500 | 1,475 | 0 | 1,475 |
| Integrity Security Management System | Internal | 14,490 | 14,490 | 9,450 | 4,540 | 13,990 |
| Improvements to the MRPS Model | Collaborative Sponsor - National Grid | 600,700 | 69,375 | 7,701 | 0 | 7,701 |
| Optimising Investments on NGN Physical Assets | Internal | 97,000 | £97,000 | 31,578 | 4,737 | 36,315 |
| TOTAL | | 1,010,785 | 267,106 | 98,339 | 31,082 | 129,421 |
| NGN Internal costs are capped at 15% of total costs | | | | 98,339 | 17,354 | 115,693 |

2. Introduction

Ofgem requires an annual report by 31st July from each Gas Distribution Network (GDN) on its IFI/SD project activity. Each project must satisfy the eligibility criteria of Technical Development, Degree of Innovation and Customer Value and align with one or more of Ofgem's five Sustainable Development Themes :-

1. Managing the transition to a low carbon economy
2. Eradicating fuel poverty and protecting vulnerable customers
3. Promoting energy saving
4. Ensuring a secure and reliable gas and electricity supply
5. Supporting improvement in all aspects of the environment

A summary of Ofgem's GDN IFI/SD arrangement is:-

- A GDN is allowed to spend up to 0.5% annually of its Distribution Network Transportation Activity Revenue on eligible IFI/SD projects.
- All projects should align with one or more of Ofgem's five Sustainable Development Themes.
- GDNs IFI/SD internal expenditure will be allowed as part of the total IFI/SD expenditure up to a maximum level of 15% of project cost
- The GDN is allowed to recover 80% of its eligible project expenditure
- A partial carry over of up to 50% of unspent eligible IFI/SD expenditure is allowed from one year to the next.
- GDNs will have to openly report their IFI/SD activities on an annual basis in accordance with the Good Practice Guide. These reports will be published on the Ofgem website.
- Ofgem reserves the right to audit IFI/SD activities

The scheme for GDNs is the Innovation Funding Incentive for Sustainable Development (IFI/SD). The aim of this incentive is to encourage GDNs to apply innovation on technical development of the networks and to deliver value (e.g. safety, quality of supply, environmental, financial) to end consumers. A Good Practice Guide (Gas Distribution IFI/SD Good Practice Guide December 2008) has been produced, published by the Energy Networks Association.

Open reporting of IFI projects is practised by Ofgem. In line with this, NGN will publish their IFI/SD report on the Northern Gas Networks website: www.northerngasnetworks.co.uk. The report will also be available on Ofgem's website: www.ofgem.gov.uk.

NGN welcomes this initiative as a positive measure to further improve customer service and efficiency, and enhance safety management.

3. NGN Network Innovation Group

To encourage the flow of innovative ideas that support corporate vision in the areas of safety management, efficiency and customer service, a Network Innovation Group (NIG) has been established comprising people from across the network (owner and operator).

The group is encouraged to come up with and develop ideas across a range of areas including construction, maintenance, refurbishment, replacement and operation.

The group meets regularly to discuss proposals for innovative projects that will be beneficial to the whole business.

Criteria considered by this group for each project align with that identified in the Gas Distribution IFI/SD Good Practice Guide. These are sustainability, safety, technical, environmental, finance, knowledge transfer, network performance, benefits, risks and mitigation.

Projects are monitored by the NIG from proposal through to completion including the monitoring of progress, benefits and risk. A post investment appraisal is carried out on completion of each project.

Some of the projects may eventually go through the IFI/SD process, but the group is primarily set up to bring forward all ideas, including those that are not considered for IFI/SD.

4. Summary of Benefits Expected from IFI/SD Projects

| Project | Benefits Expected |
|---|--|
| Alternative Inspection Technique For Buried Pipelines | <p>The technique will minimise costs for inspecting difficult to inspect areas. The increased understanding of the condition of the asset in these areas should allow GDNs to take appropriate remedial measures quickly to prevent a major pipeline failure.</p> <p>The financial benefit to accrue from this project is avoiding costs of unexpected failures and subsequent cost penalties due to failure to supply.</p> |
| Nozzle Weld Materials Testing | <p>Provides improved understanding of high pressure vessel asset life with potential to extend the predetermined life of critical storage asset whilst maintaining fit for purpose assets.</p> <p>Knowledge gained will be applied to future decisions on life cycle of high pressure storage vessels which have a pre determined design life at the end of which they are taken out of service.</p> <p>This project took advantage of the decommissioning of high pressure vessels to complete testing of used construction materials from HP vessels to demonstrate that asset life can be extended.</p> |
| Pipeline Fatigue Revalidation | <p>Methodology for the analysis of data and calculations for Assessing the Fatigue Life of HP Pipelines that have not seen a high level hydrotest leading to an extension of the fatigue life of the pipelines, providing a lower cost alternative to testing each pipeline</p> |
| In-Line Inspection Dent Assessment | <p>Avoidance of unexpected failures and avoidance of cost penalties due to failure to supply.</p> <p>A number of companies have developed dent assessment methodologies. This project is to review all the current practices and identify and incorporate the best elements that will provide clear, concise understanding for GDNs on whether remedial action is required.</p> <p>The new tool will minimise costs for inspecting difficult to inspect areas and give increased understanding of the condition of the asset in these difficult to inspect areas. Allows GDNs to take appropriate remedial measures quickly to prevent a major pipeline failure.</p> |

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| <p>Improvements to Emergency Call Handling</p> | <p>Potential reduction in reporting of numbers of uncontrolled escapes could result in Opex savings from reduced number of FCOs on standby</p> <p>Will yield knowledge in relation to consumer behaviours and managing risk, responses will be better targeted at the higher risks, leading to improvement in overall level of safety</p> <p>Better prioritisation of emergency response will mitigate against escapes leading to potential minor/major incidents</p> |
| <p>Integrity Security Management System</p> | <p>Records of security defences in a comprehensive data base allowing access to critical information by network integrity team. Also will permit tracking of authorised access to sites by individuals and groups including details of individuals' access rights.</p> |
| <p>Improvements to the MRPS Model</p> | <p>Will assist GDNs in defending the model robustly when challenged by the HSE.</p> <p>Any improvement in the way in which mains are prioritised for replacement will affect the UK incident level. This has a direct impact on improving safety but is very difficult to quantify.</p> <p>The ability of MRPS to identify mains before they leak will have a direct impact on the level of methane emissions from the UK distribution system. In addition, more efficient planning of mains replacement has a direct impact on road closures and traffic congestion.</p> <p>The MRPS is model is used to effectively replace those pipes with a higher degree of risk. By doing so, the GDN can allocate expenditure accordingly and avoid significant cost if a minor or major incident occurs.</p> <p>The application of a credible methodology for identifying mains at risk will contribute to mitigation measure for any potential litigation arising from fatalities linked to incidents.</p> |
| <p>Optimising Investments on NGN Physical Assets</p> | <p>Optimised asset investment decisions supported by rationale explanation based on historic asset performance together with ability to quickly run different investment scenarios to evaluate the impact of different budget caps.</p> |

5. Conclusion

The IFI/SD arrangement, incorporating the Good Practice Guide, provides robust governance for a GDN's approach to research and development allowing a controlled method for a GDN to consider all projects for IFI/SD eligibility including those that may eventually be excluded.

NGN recognises the importance of the role that research and development plays in contributing to the gas industry providing continuous improvement to customer service and the growing importance of sustainable development within this industry. This IFI/SD system provides a useful tool for delivering efficiencies across our business.

NGN's intention is to focus on delivering the benefits of innovative projects to our customers and consumers that further improve safety, efficiency and customer service whilst also considering sustainable development.

Section 6

Northern Gas Networks

Summary Report of IFI/SD Project Activities

For Period 1st April 2008 to 31st March 2009

Section 6

Northern Gas Networks

Summary Report of IFI/SD Project Activities

For Period 1st April 2008 to 31st March 2009

| | |
|---|--|
| Distribution Network Transportation Activity Revenue £(m) | 300.3 |
| IFI/SD Allowance £(m) | 1.5 |
| Unused IFI/SD Carry Forward to 2009/2010 £(m) | 0.75 |
| Number of Active IFI/SD Projects | 8 |
| Summary of Benefits Anticipated From IFI/SD Projects | Refer to Section 4 – Summary of Benefits Expected from IFI/SD Projects |
| External Expenditure 2008/2009 on IFI/SD Projects | £98,339 |
| Internal Expenditure 2008/2009 on IFI/SD Projects (Capped at 15%) | £17,354 |
| Total Expenditure 2008/2009 on IFI/SD Projects | £115,693 |
| Benefits Achieved From IFI/SD Projects To Date | Benefits from completed projects will start to be achieved in current financial year 2009/2010 |

Section 7

Northern Gas Networks

IFI/SD Project Reports

For Period 1st April 2008 to 31st March 2009

| | | | |
|--|---|--|---|
| Project Title | Alternative Inspection Technique For Buried Pipelines | | |
| Description of project | To develop an alternative inspection technique for monitoring the condition of high pressure steel pipelines externally (OLI/4) that cannot be pigged due to difficult circumstances. | | |
| Expenditure for financial year 2008/2009 | Internal £0 External £2,560 Total £2,560 | Expenditure in previous (IFI/SD) financial years | Internal £0 External £0 Total £0 |
| | Materials Expenditure £0 | | Materials Expenditure £0 |
| Total Project Costs (Collaborative + external + NGN) | £109,090 | Projected 2010 costs for NGN | Internal £0 External £9,801 Total £9,801 |
| Alignment with Sustainable Development Themes | Ensuring a secure and reliable gas and electricity supply This project will develop a technique for inspecting non piggable pipelines on the above 7 bar network, and thus Networks can mitigate the risk of an incident occurring by understanding fully the condition of its pipeline assets. | | |
| Technological area and / or issue addressed by project | <p>The limitations of above ground survey techniques currently employed as part of the OLI/4 process have been identified.</p> <p>The shortcomings of above ground techniques to provide information related to coating damage and Cathodic Protection potentials in difficult to inspect areas, such as hard surface and sleeved and unsleeved crossings, have been identified.</p> <p>Techniques that may be able to provide data in difficult to inspect areas have been identified for site trials to be undertaken within Stage 2 of this project.</p> <p>The limitations of LRUT for measuring metal loss features that</p> | | |

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| | may compromise the integrity of high pressure pipelines have been identified. | | |
| Type(s) of innovation involved | Incremental – The main purpose of the project is to review existing tools and techniques and identify and incorporate best practice and thus enhance the existing OLI/4 protocols | | |
| Project Benefits Rating | Project Residual Risk | Overall Project Score | |
| 6 | -8 | 14 | |
| Expected Benefits of Project | <p>Incidents concerning the failure of >7 bar pipelines tend to be catastrophic events. Where such pipelines are located in populated areas, any such failure exposes staff and the general public to risk.</p> <p>The technique will minimise costs for inspecting difficult to inspect areas. The increased understanding of the condition of the asset in these difficult to inspect areas should allow GDNs to take appropriate remedial measures quickly to prevent a major pipeline failure. This will allow pipelines to be operated to the maximum safe level.</p> <p>The main financial benefit to accrue from this project is avoiding costs of unexpected failures and subsequent cost penalties due to failure to supply. To calculate an accurate value directly related to this risk is difficult to quantify as there are probably no historic incidents to compare against.</p> <p>The notional value of a potential pipeline failure and penalty due to failure to deliver is taken as £1m. This is an estimate that includes costs associated with repair, recommissioning if the failure occurred on a critical pipeline, loss of gas supplies, compensation, and responding to subsequent regulatory action.</p> | | |
| Expected Timescale to adoption | 1 Years | Duration of benefit once achieved | 5 Years |
| Probability of Success | 80% | Project NPV = (PV Benefits – PV Costs) x Probability of Success | £733,223 |

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| Potential for achieving expected benefits | The expected project benefits should be achieved. Stage 1 of the project progressed and was completed as planned. The proposal for stage 2 is in line with the initial project objectives. |
| Project Progress | <p>The preferred indirect inspection techniques that are currently used within the OLI/4 process and for other pipeline surveys have been reviewed along with their limitations in difficult to inspect areas including pipeline segments running under hard surfaces and through sleeved and unsleeved crossings.</p> <p>Information has been provided on alternative inspection techniques, to those referred to within the OLI/4 document but not routinely used, in order to make a judgement on their ability to detect corrosion risks in difficult to inspect areas.</p> <p>The ability of above ground survey techniques for sizing coating defects has been assessed for the above ground inspection techniques.</p> <p>The ability of Long Range Ultrasonic Testing (LRUT) for assessing the integrity of sleeved and unsleeved crossings has been reviewed.</p> |
| Collaborative Partners | National Grid, Northern Gas Networks, Scotia Gas Networks, Wales & West Utilities |
| Service Provider | GL Services Ltd – Stage 1 (GL Industrial Services going forward) – Stage 2 |

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| Project Title | Nozzle Weld Materials Testing | | |
| Description of project | <p>Ensure continued safe and reliable use of high pressure gas storage vessels, and maintaining a security of supply</p> <p>The GDNs have a duty under Pipeline Safety Regulations (PSR) and Pressure System and Safety Regulations (PSSR) to maintain the integrity of its network assets and by doing so ensuring a safe and reliable supply to end users.</p> <p>High pressure storage vessels are used to support the GDN diurnal storage requirements and as such are critical to maintaining security of supply. HP vessels have a pre determined design life at the end of which they should be taken out of service, with the subsequent loss of storage. However by testing construction materials from HP vessels which have seen continuous use over a prolonged period it maybe possible to demonstrate that the asset life can be extended, and by doing so delay investment in alternative storage facilities, whilst ensuring a safe and secure gas supply.</p> | | |
| Expenditure for financial year 2008/2009 | Internal £ 5,000 External £18,700 Total £23,700 | Expenditure in previous (IFI/SD) financial years | Internal £0 External £0 Total £0 |
| | Materials Expenditure £0 | | Materials Expenditure £0 |
| Total Project Costs (Collaborative + external + [company]) | £79,800 | Projected 2010 costs for NGN | Internal £0 External £0 Total £0 |
| Alignment with Sustainable Development Themes | Ensuring a secure and reliable gas and electricity supply Ensure continued safe and reliable use of high pressure gas storage vessels, and maintaining a security of supply | | |

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| Technological area and / or issue addressed by project | <p>A major part of a revalidation assessment is to demonstrate the fracture toughness of the material; the values are determined by the testing and analysis of material data.</p> <p>The project is made up of three parts; material testing (70% of project), analysis of test data and a final report</p> <p>GL Services developed a test specification and all testing was subcontracted to a specialist test house.</p> | | |
| Type(s) of innovation involved | <p>Incremental</p> <p>Development of existing asset fatigue life data</p> | | |
| Project Benefits Rating | Project Residual Risk | Overall Project Score | |
| 9 | -8 | 17 | |
| Expected Benefits of Project | <p>Provides improved understanding of high pressure vessel asset life with potential to extend the predetermined life of critical storage asset whilst maintaining fit for purpose assets.</p> <p>Knowledge gained will be applied to future decisions on life cycle of high pressure storage vessel</p> | | |
| Expected Timescale to adoption | 1 Year | Duration of benefit once achieved | 5 Years |
| Probability of Success | 90% | Project NPV = (PV Benefits – PV Costs) x Probability of Success | Non-financial benefits |
| Potential for achieving expected benefits | <p>The testing, analysis and final report demonstrate the continued use of high pressure storage vessels, security of supply and fit for purpose assets.</p> <p>The project delivered as per agreed scope set out within the GL Services proposal and concluded with the issuing of GL Services report R4516 issue 2 to all project sponsors, during January 2009.</p> | | |

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| Project Progress | <p>High pressure storage vessels are used to support the GDN diurnal storage requirements and as such are critical to maintaining security of supply. HP vessels have a pre determined design life at the end of which they should be taken out of service, with the subsequent loss of storage. However by testing construction materials from HP vessels which have seen continuous use over a prolonged period it has been possible to demonstrate that the asset life can be extended, and by doing so has enabled delayed investment in alternative storage facilities, whilst ensuring a safe and secure gas supply.</p> <p>The final report was issued in January 2009.</p> |
| Collaborative Partners | National Grid, Northern Gas Networks, Scotia Gas Networks, Wales & West Utilities |
| Service Provider | GL Services Ltd |

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| Project Title | Pipeline Fatigue Revalidation | | |
| Description of project | <p>Five pipelines within NGN are reported as being passed their fatigue life. There is a requirement to reassess their fatigue life to ensure future use.</p> <p>This project is to review methods of revalidation and assess fatigue life against the latest edition of IGE/TD1 taking into account pipeline pressure cycling operations</p> | | |
| Expenditure for financial year 2008/2009 | Internal £14,000 External £22,200 Total £36,200 | Expenditure in previous (IFI/SD) financial years | Internal £0 External £0 Total £0 |
| | Materials Expenditure £0 | | Materials Expenditure £0 |
| Total Project Costs (Collaborative + external + NGN) | £36,200 | Projected 2010 costs for NGN | Internal £0 External £0 Total £0 |
| Alignment with Sustainable Development Themes | Ensuring a secure and reliable gas and electricity supply Ensures safe future use of pipeline | | |
| Technological area and / or issue addressed by project | Report (PIE/08/R0203) details the fracture mechanics fatigue assessment of five NGN pipelines identified as approaching the end of their predicted fatigue life. The fatigue analysis takes into account the actual hydrotest levels of the pipelines, recorded pressure data and the operational history of the pipelines, and is carried out in accordance with the recommendations in IGE/TD/1 Edition 4 and NGN/SP/TR/19 [6], the industry Specification for Assessing the Fatigue Life of Transmission Pipelines Designed in Accordance with IGE/TD/1. | | |

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| Type(s) of innovation involved | Technology Substitution from different application | | |
| Project Benefits Rating | Project Residual Risk | Overall Project Score | |
| 16 | -7 | 23 | |
| Expected Benefits of Project | Development of a methodology for the analysis of data and calculations for Assessing the Fatigue Life of HP Pipelines that have not seen a high level hydrotest leading to an extension of the fatigue life of the pipelines and provides a lower cost alternative to testing each pipeline | | |
| Expected Timescale to adoption | 1 Year | Duration of benefit once achieved | 5 Years |
| Probability of Success | 100% | Project NPV = (PV Benefits – PV Costs) x Probability of Success | £1,026,283 |
| Potential for achieving expected benefits | Pipeline Fatigue Revalidation study report undertaken by Pipeline Integrity Engineers (PIE) on behalf of NGN provided fatigue analysis and identified that pipelines were revalidated for future use. | | |
| Project Progress | Report PIE/08/R0203 on pipeline fatigue revalidation is complete | | |
| Collaborative Partners | None – Northern Gas Networks only | | |
| Service Provider | Pipeline Integrity Engineers (PIE) | | |

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|--|--|--|---|
| Project Title | In-Line Inspection Dent Assessment | | |
| Description of project | To develop a robust dent assessment methodology fit for purpose for UK adoption | | |
| Expenditure for financial year 2008/2009 | Internal £2,805 External £4,675 Total £7,480 | Expenditure in previous (IFI/SD) financial years | Internal £0 External £0 Total £0 |
| | Materials Expenditure £0 | | Materials Expenditure £0 |
| Total Project Costs (Collaborative + external + [company]) | £21,505 | Projected 2010 costs for NGN | Internal £0 External £0 Total £0 |
| Alignment with Sustainable Development Themes | Ensuring a secure and reliable gas and electricity supply A high level screening decision making tool contributes in the evolution of the findings for In Line Inspection | | |
| Technological area and / or issue addressed by project | <p>The tool developed will consider the following factors:</p> <ul style="list-style-type: none"> • The size, shape and location of the dent (i.e., the position of the dent around the pipe circumference and the proximity of the dent to a girth or seam weld). • Whether the dent is associated with any metal loss. • The likelihood that the dent is due to mechanical damage. • The linepipe properties. • The design stress level of the pipeline. • Whether there is the potential for the damage to reduce the fatigue life of the pipeline. | | |

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| | <ul style="list-style-type: none"> • The requirement for a pressure reduction. <p>The review will also include relevant work undertaken by GL Services on behalf of the sponsors, and work from PRCI/EPRG Joint Technical Meetings, or work in the public domain such as PDAM[5].</p> <p>Successful delivery of this project will result in common dent assessment methodology that will enable GDNs to incorporate into their own ILI policy and procedural documentation.</p> | |
| Type(s) of innovation involved | <p>Incremental</p> <p>Develop and enhance the P11 document with a more robust methodology concerning how dents identified from the in-line inspection are assessed for remedial action. This is a significant enhancement when compared against current practice.</p> | |
| Project Benefits Rating | Project Residual Risk | Overall Project Score |
| 11 | -9 | 20 |
| Expected Benefits of Project | <p>The main financial benefit from this project is avoidance of unexpected failures and avoidance of cost penalties due to failure to supply. To calculate an accurate value directly related to this risk is difficult to quantify as there are no historic suitable incidents to compare against.</p> <p>A number a companies have developed dent assessment methodologies. This project is to review all the current practices and identify and incorporate the best elements that will provide clear, concise understanding for GDNs on whether remedial action is required.</p> <p>The new tool will reduce costs for inspecting difficult to inspect areas. The increased understanding of the condition of the asset in these difficult to inspect areas should allow GDNs to take appropriate remedial measures quickly to prevent a major pipeline failure. This will allow pipelines to be operated to the maximum safe level.</p> | |

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| Expected Timescale to adoption | 1 Year | Duration of benefit once achieved | 15 Years |
| Probability of Success | 90% | Project NPV = (PV Benefits – PV Costs) x Probability of Success | £134,823 |
| Potential for achieving expected benefits | <p>There are a number of companies who have developed dent assessment methodologies. This project has provided a common methodology for all GDNs which identifies and incorporates the best elements that provides clear, concise understanding for GDNs on whether remedial action is required.</p> <p>GL Services report was delivered to the project sponsors on 1st December 2008.</p> | | |
| Project Progress | <p>The deliverable for this project was a report which provided a review of the current understanding of the integrity of dent damage in pipelines together with a 'high level' flow chart for undertaking a screening assessment of the severity of a dent in a pipeline.</p> <p>The report also included relevant work undertaken by GL Services on behalf of the sponsors.</p> <p>This report resulted in a common dent assessment methodology that GDNs can incorporate into their own ILI policy and procedural documentation.</p> | | |
| Collaborative Partners | National Grid, Northern Gas Networks, Scotia Gas Networks, Wales & West Utilities, National Grid Transmission | | |
| Service Provider | GL Services Ltd | | |

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|--|--|--|---|
| Project Title | Improvements to Emergency Call Handling | | |
| Description of project | To improve the effectiveness and efficiency of the emergency call handling service, with resulting improvements in overall safety of the network. | | |
| Expenditure for financial year 2008/2009 | Internal £0 External £1,475 Total £1,475 | Expenditure in previous (IFI/SD) financial years | Internal £0 External £0 Total £0 |
| | Materials Expenditure £0 | | Materials Expenditure £0 |
| Total Project Costs (Collaborative + external + NGN) | £52,000 | Projected 2010 costs for NGN | Internal £0 External £5,025 Total £5,025 |
| Alignment with Sustainable Development Themes | <p>Managing the transition to a low carbon economy</p> <p>Minor Alignment through more efficient use of resources (less travel) and reduced emissions through faster response to uncontrolled escapes</p> <p>Ensuring a secure and reliable gas and electricity supply</p> <p>Good alignment as this will lead to more effective management of the gas transportation assets and enhance the safety and reliability of reliability of supply</p> <p>Supporting improvement in all aspects of the environment</p> <p>More effective use of resources will reduce environmental impacts</p> | | |

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| <p>Technological area and / or issue addressed by project</p> | <p>It is proposed to assess the Emergency Call Handling Package (ECHP) stage of the call handling process, to establish the manner in which it seeks to classify potential gas escapes, including gas escapes from pipework or appliances, strange smells/fumes and CO issues or alarms, as being Controlled or Uncontrolled, in compliance with legislative requirements. ECHP scripts prompting the caller to answer key questions concerning the potential escape or CO emissions will be assessed.</p> <p>A study will collate information on a number of UK-marketed alarms, with the particular focus on low battery or cell malfunction indication. The outcome is to provide details of alarms to enable call centre staff to be able to differentiate between “real” CO indication and low battery/cell malfunction indication. A revision of the procedure is required to identify false alarms, give appropriate advice and avoid the need to divert finite resources from real escapes.</p> | |
| <p>Type(s) of innovation involved</p> | <p>Incremental</p> <p>Improvements to existing call handling scripts and processes</p> | |
| <p>Project Benefits Rating</p> <p>21</p> | <p>Project Residual Risk</p> <p>-7</p> | <p>Overall Project Score</p> <p>28</p> |
| <p>Expected Benefits of Project</p> | <p>Potential reduction in numbers of uncontrolled escapes could result in Opex savings from reduced number of FCOs on standby (may avoid having to attend site in some situations)</p> <p>Will yield valuable knowledge in relation to consumer behaviours and managing risk</p> <p>Changes will mean that responses will be better targeted at the higher risks, leading to improvement in overall level of safety</p> <p>Minor improvement to environmental performance through better utilisation of resources</p> | |

| | | | |
|---|--|---|------------------------|
| | <p>Will lead to sustainable improvement in gas escape management</p> <p>Better prioritisation of emergency response will mitigate against escapes leading to potential minor/major incidents</p> | | |
| Expected Timescale to adoption | TBC | Duration of benefit once achieved | TBC |
| Probability of Success | 75% | Project NPV = (PV Benefits – PV Costs) x Probability of Success | Non-financial benefits |
| Potential for achieving expected benefits | <p>Success is not dependent on new technologies. High degree of confidence that script changes will be robust enough to meet Regulatory scrutiny and will be acceptable for implementation by NG.</p> <p>It is expected that the required changes will be implemented via the call services contract modification process.</p> | | |
| Project Progress | <p>Project is in development with assessment of the Emergency Call Handling Package scripts and Carbon Monoxide (CO) Alarm Differentiation is in progress.</p> | | |
| Collaborative Partners | <p>National Grid, Northern Gas Networks, Scotia Gas Networks, Wales & West Utilities</p> | | |
| Service Providers | <p>GL Services Ltd and Advanced Engineering Solutions Ltd</p> | | |

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| Project Title | Integrity Security Management System | | |
| Description of project | The project is to develop a secure and reviewable database system for storage of network asset security audits, details of break-ins and unauthorized access, record security defences and constant tracking of authorized access to sites including holding details of authorized individuals' access rights to sites. | | |
| Expenditure for financial year 2008/2009 | Internal £4,540 External £9,450 Total £13,990 | Expenditure in previous (IFI/SD) financial years | Internal £0 External £0 Total £0 |
| | Materials Expenditure £0 | | Materials Expenditure £0 |
| Total Project Costs (Collaborative + external + NGN) | £14,490 | Projected 2010 costs for NGN | Internal £0 External £0 Total £0 |
| Alignment with Sustainable Development Themes | Ensuring a secure and reliable gas and electricity supply Managing the integrity of on-going security arrangements of the network assets | | |
| Technological area and / or issue addressed by project | Development of a database to collate record and retrieve information to provide a secure and robust system for network integrity staff. Information will be held in Microsoft Access and will comprise details of audits, site administration and security arrangements and details any break-ins. | | |
| Type(s) of innovation involved | Incremental | | |

| | | | |
|---|--|---|------------------------|
| Project Benefits Rating | Project Residual Risk | Overall Project Score | |
| 10 | -11 | 21 | |
| Expected Benefits of Project | Records of security defences in a comprehensive data base allowing access to critical information by network integrity team .Also will permit Constant tracking of authorised access to sites by individuals and groups including details of individuals' access rights. | | |
| Expected Timescale to adoption | Imminent | Duration of benefit once achieved | On going |
| Probability of Success | 100% | Project NPV = (PV Benefits – PV Costs) x Probability of Success | Non-financial benefits |
| Potential for achieving expected benefits | Database is established and in use | | |
| Project Progress | Project is complete and database is being used for audits, recording security information, site administration and recording any site break-ins. | | |
| Collaborative Partners | None – Northern Gas Networks only | | |
| Service Provider | Advanced Engineering Solutions Ltd | | |

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| Project Title | Improvements to the MRPS Model | | |
| Description of project | The key objective of the project is to develop improvements to the MRPS model to efficiently identify mains that are likely to leak and therefore reduce the risk of fire/explosion from any potential escape, to enhance safety to employees and the general public whilst also complying with legislation. | | |
| Expenditure for financial year 2008/2009 | Internal £0 External £7,701 Total £7,701 | Expenditure in previous (IFI/SD) financial years | Internal £0 External £0 Total £0 |
| | Materials Expenditure £0 | | Materials Expenditure £0 |
| Total Project Costs (Collaborative + external + NGN) | £600,700 | Projected 2010 costs for NGN | Internal £0 External £11,000 Total £11,000 |
| Alignment with Sustainable Development Themes | <p>Ensuring a secure and reliable gas and electricity supply</p> <p>This project will investigate possible enhancements to the methodology including the consideration of age as a factor with the cast iron model, and the inclusion of corrosion information in the spun cast model to take account of fissure corrosion. The project will also examine the impact of any changes in terms of risk profile and the potential to increase the rate of reduction of risk and leakage from current levels. The work proposed has been costed over a 5 year period.</p> <p>Supporting improvement in all aspects of the environment</p> <p>The ability of MRPS to identify mains before they leak will have a direct impact on the level of methane emissions from the UK distribution system. In addition, more efficient planning of mains replacement has a direct impact on road closures and traffic congestion</p> | | |

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| <p>Technological area and / or issue addressed by project</p> | <p>The UK gas industry GDNs are all subject to a mains replacement policy which dictates that all ferrous distribution gas mains within 30 metres of property are replaced by 2032. The overall cost of this programme is in excess of £10 billion. The current means of prioritising mains to deliver this programme is to use MRPS which estimates the risk of incident associated with each mains unit. The methodology used within MRPS has been developed by GL Industrial Services and the weightings have been updated regularly. However, the basic methodology has not changed for several years. This project will investigate possible enhancements to the methodology including the consideration of age as a factor with the cast iron model, and the inclusion of corrosion information in the spun cast model to take account of fissure corrosion. The project will also examine the impact of any changes in terms of risk profile and the potential to increase the rate of reduction of risk and leakage from current levels. The work proposed within this proposal has been costed over a 5 year period.</p> <p>The result will be an assessment of the feasibility of improving the way in which MRPS currently identifies mains for replacement, based primarily upon a measure of risk. Tasks which have shown the likelihood of improving MRPS can then be selected for inclusion in MRPS the following year as part of the update process. Any improvements in the way in which MRPS selects mains for replacement should manifest itself in changes to the failure rate, gas in building rate and incident rate for the UK as a whole. These statistics will be examined each year as part of the trend analysis so the effectiveness of the programme can be monitored.</p> | |
| <p>Type(s) of innovation involved</p> | <p>Incremental</p> <p>The MRPS risk model will be enhanced to include new profiling factors that did not exist before i.e. Corrosion of spun cast and age of pit cast, plus a significant update to >12" model.</p> | |
| <p>Project Benefits Rating</p> <p>20</p> | <p>Project Residual Risk</p> <p>-4</p> | <p>Overall Project Score</p> <p>24</p> |

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| <p>Expected Benefits of Project</p> | <p>The knowledge used to analyse the data and produce improvements to MRPS will be communicated in detail to the industry participants. This understanding will assist GDNs in defending the model robustly when challenged by the HSE.</p> <p>Any improvement in the way in which mains are prioritised for replacement will affect the UK incident level. This has a direct impact on improving safety but is very difficult to quantify.</p> <p>The ability of MRPS to identify mains before they leak will have a direct impact on the level of methane emissions from the UK distribution system. In addition, more efficient planning of mains replacement has a direct impact on road closures and traffic congestion</p> <p>The MRPS is model is used to effectively replace those pipes with a higher degree of risk. By doing so, the GDN can allocate expenditure accordingly and avoid significant cost if a minor or major incident occurs.</p> <p>The application of a credible methodology for identifying mains at risk.</p> | | |
| <p>Expected Timescale to adoption</p> | <p>5 Years</p> | <p>Duration of benefit once achieved</p> | <p>20 Years</p> |
| <p>Probability of Success</p> | <p>50%</p> | <p>Project NPV = (PV Benefits – PV Costs) x Probability of Success</p> | <p>Non-financial benefits</p> |

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| <p>Potential for achieving expected benefits</p> | <p>This specific project is being managed via the National Replacement Forum (NRF) that has representation from all four Gas Distribution Network operators. A review of the project benefits was undertaken on 23.04.09 as part of the stage closure process for the first stage. The group concluded that the current benefits documented were robust and ranked accordingly and that it was still very difficult to provide precise quantification for each one listed. Safety remains the primary benefit for this project as MRPS enables a GDN to prioritise its resources according to the risk score as calculated via this methodology. If an incident does occur a GDN can fully demonstrate the understanding and application of the up to date knowledge ascertained from this project if challenged by the HSE or regulator.</p> <p>The group did agree to amend the NPV. This is on the basis that if any of the planned work requires extensive further investigation the cost for doing so is not factored into the current programme, as most of the planned work is feasibility in nature. This will be included as a specific risk to the project also.</p> |
| <p>Project Progress</p> | <p>It has been clearly demonstrated that there is no discernible link between fracture rates and the age of pit cast iron. This finding is beneficial to the industry enabling any potential impacts to be clearly ruled out and negating the need for further investment in this area. This also allows the planned programme of work to move forward examining other potential relationships that may have a bearing in how risk in the MRPS model are presented.</p> <p>Trend analysis of gas in building occurrences, failures and incidents has been carried out to determine if deterioration of the system is occurring over time. The analysis highlighted some issues with particular GDN's data which has been resolved. No statistically significant changes were evident and therefore it was recommended that the co-efficients remain unchanged for 2008.</p> |
| <p>Collaborative Partners</p> | <p>National Grid, Northern Gas Networks, Scotia Gas Networks, Wales & West Utilities</p> |
| <p>Service Provider</p> | <p>GL Services Ltd</p> |

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| Project Title | Optimising Investments in NGN Physical Assets | | |
| Description of project | <p>The project objective is to prove the utility of WiLCO (Whole Life Cost Optimisation) for supporting NGN's Asset Investment Planning (AIP) requirements. To demonstrate optimisation for strategic capital investment over more traditional methods of strategic investment planning.</p> <p>To demonstrate that a modelling environment used in other utility sectors can be used to identify the impact that different strategies have on whole life cost and future asset performance to advise capital investment decisions</p> <p>To provide a model for the utilisation of existing, asset knowledge to drive asset investment decisions</p> <p>Based on the outputs of the project, to evaluate the future utility of WiLCO for NGN's AIP requirements</p> | | |
| Expenditure for financial year 2008/2009 | Internal £4,737 External £31,578 Total £36,315 | Expenditure in previous (IFI/SD) financial years | Internal £0 External £0 Total £0 |
| | Materials Expenditure £0 | | Materials Expenditure £0 |
| Total Project Costs (Collaborative + external + NGN) | £97,000 | Projected 2009/10 costs for NGN | Internal £3,263 External £57,422 Total £60,685 |

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| <p>Alignment with Sustainable Development Themes</p> | <p>Ensuring a secure and reliable gas and electricity supply</p> <p>The WiLCO model when populated with NGN asset types and asset systems will provide confidence and visibility of all factors being considered including risk, performance and interventions asset life maintenance regimes when making Capital investment decisions and will enhance decision making that will further improve safety and security of the Network.</p> <p>The model will not reduce the level of investment but can help ensure investments are made in the most advantageous way.</p> |
| <p>Technological area and / or issue addressed by project</p> | <p>The Feasibility Phase will aim to model a small sample of NGN's above ground assets; the model built in this stage will cover no more than 25% of these assets. If the conclusion from the feasibility phase is that a WiLCO model is an a suitable method of modelling NGN's above ground assets then the project will be extended with the model being extended to cover 25-50% of NGN's above ground assets.</p> <p>The project will be deemed a success if it is able to clearly demonstrate investment efficiency of the new strategic planning method; showing within the model the higher return per pound spent in terms of condition, service and risk. The project includes an activity to compare the optimisation outputs against traditional methods of investment planning; which will serve to measure the project success.</p> <p>A WiLCO model enables the complex relationships between costs, assets, risk, performance, service levels, interventions and available resources to be captured and expressed both temporally and spatially. Using the model the decisions facing all levels of a company can be elaborated through scenario analysis and optimisation to enable better informed decisions to be made with confidence. The models look over long time horizons in line with long asset life times (e.g. 30 to 50 years). These strategic plans are then linked to budget years. The models are also pitched at a strategic level spatially, but then link the strategic decisions to individual schemes and asset decisions.</p> |

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| Type(s) of innovation involved | Substitution (industry) The WiLCO Modelling technology has been successfully implemented for to inform capital investment decisions in asset intensive sectors including water, rail and highways | | |
| Project Benefits Rating | Project Residual Risk | Overall Project Score | |
| 14 | -1 | 15 | |
| Expected Benefits of Project | Optimised asset investment decisions supported by rationale explanation based on historic asset performance together with ability to quickly run different investment scenarios to evaluate the impact of different budget figures. | | |
| Expected Timescale to adoption | 2 Year | Duration of benefit once achieved | 20 Years |
| Probability of Success | 70% | Project NPV = (PV Benefits – PV Costs) x Probability of Success | Non-financial benefits |
| Potential for achieving expected benefits | The WiLCO model has been successfully deployed in other asset intensive sectors including the water industry, Highways and rail where research shows it is very well regarded | | |
| Project Progress | <p>An initial model has been built and populated this has demonstrated how the interrelationship between asset age, asset planned life, maintenance standards and capital interventions.</p> <p>Training has been given to network staff in using the models to demonstrate different investment scenarios, intervention strategies etc.</p> <p>An updated asset base for the model including actual customer numbers supplied by AGIs below off-takes will be incorporated to strengthen the outputs of the model.</p> | | |
| Collaborative Partners | None – Northern Gas Networks only | | |
| Service Provider | SEAMS Ltd | | |