

Company Secretary
National Grid Gas Transmission
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Date: 19 December 2014

Dear Company Secretary,

Project Direction ref: National Grid Gas Transmission / In Line Robotic Inspection of High Pressure Installations / 19 December 2014

National Grid Gas Transmission plc (NGGT) submitted the project *In Line Robotic Inspection of High Pressure Installations* on 25 July 2014 to us to be considered for funding through the Gas Network Innovation Competition (NIC). In this year's decision, we selected the Project¹ for funding.^{2,3}

We have issued this Project Direction to NGGT. It contains the terms to be followed by NGGT as a condition of the Project receiving funding through the Gas NIC. It must comply with these terms, which can be found in the schedule to this Project Direction.

Project Direction

Paragraph 5.66 of the Gas NIC Governance Document states that a Project Direction will:

- set out the Project-specific conditions that the Network Licensee is committing to in accepting funding;
- require the Network Licensee to undertake the Project in accordance with the commitments it has made in the Full Submission. Where appropriate, the Project Direction may therefore include extracts from the Full Submission or refer to specific sections of the Full Submission;
- set out the Approved Amount for the Project, that will form part of the calculation contained in the funding direction issued by the Authority under chapter 7 of the Governance Document;

¹ Unless otherwise specified, defined terms in this Project Direction have the meaning given to them in Appendix 1 of the Gas NIC Governance Document.

² <https://www.ofgem.gov.uk/publications-and-updates/decision-second-year-gas-network-innovation-competition>.

³ The terms 'the Authority', 'Ofgem', 'we', 'us' and 'our' are used interchangeably in this letter. The Authority is the Gas and Electricity Markets Authority. Ofgem is the Office of the Authority.

- set out the Project Budget that the Network Licensee must report against and how variances against the Project budget will be reported and approved; and
- the mechanism for the Network Licensee receiving the Approved Amount is set out in the Funding Direction.

These are described for the Project in the schedule to this Project Direction.

Decision

Provided NGGT complies with the NIC Governance Document and with the schedule to this Project Direction, the Project is deemed to be an Eligible NIC project.⁴

This Project Direction constitutes notice pursuant to section 38A (Reasons for decisions) of the Gas Act 1986.

Yours faithfully,



Andy Burgess

Associate Partner, Transmission and Distribution Policy

For and on behalf of the Authority

⁴ Eligible NIC Project has the meaning given in definitions of the National Grid Gas Plc (NTS) Gas Transporter Licence.

Schedule to Project Direction

1. TITLE

Project Direction ref: NGGT / *In Line Robotic Inspection of High Pressure Installations* / 19 December 2014

2. PREAMBLE

This Project Direction issued by the Gas and Electricity Markets Authority (the "Authority") to NGGT (the "Funding Licensee") pursuant to the Gas NIC Governance Document issued pursuant to Part E of Special Condition 2F (Network Innovation Competition) of the National Grid Gas Plc (NTS) Gas Transporter Licence (the "Licence") sets out the terms to be followed by the Funding Licensee in relation to *In Line Robotic Inspection of High Pressure Installations* ("the Project") as a condition of the Project being funded under the NIC and the Funding Return Mechanisms.⁵

Unless otherwise specified, defined terms in this Project Direction have the meaning given to them in Appendix 1 of the Gas NIC Governance Document.

References to specific sections of the Funding Licensee's Full Submission in this Project Direction are, for ease of reference, made by referring to the section number in the Funding Licensee Full Submission pro-forma.

3. ADEQUACY OF FUNDING AND FUNDING ALLOCATION

The Funding Licensee acknowledges that the budget allocations set out in Appendix 1 as restricted in certain circumstances described below will allow it to fulfil its obligations under this Project Direction.

4. CONDITION PRECEDENT

The Funding Licensee will not access any funds from the Project Bank Account until it has signed contracts with the Project Partners named in Table 1.

Table 1. Project partners

1. Synthotech Ltd
2. Premtech Ltd
3. Pipeline Integrity Engineers Ltd

5. COMPLIANCE

The Funding Licensee must comply with Special Condition 2F of the Licence and with the NIC Governance Document (as may be modified from time to time in accordance with Special Condition 2F and as modified and/or augmented in respect of the Project by this Project Direction) and with this Project Direction.

⁵ The Funding return Mechanism is defined in 2F (Network Innovation Competition) of the National Grid Gas Plc (NTS) Gas Transporter Licence.

Any part of the Approved Amount that the Authority determines not to have been spent in accordance with this Project Direction (or with the Gas NIC Governance Document) is deemed to be Disallowed Expenditure.

Pursuant to Special Condition 2F Disallowed Expenditure is revenue received (whether by the Funding Licensee or another Licensee) under the NIC and Funding Return Mechanisms that the Authority determines not to have been spent in accordance with the provisions of the Gas NIC Governance Document or with those of the relevant Project Direction.

Pursuant to paragraph 8.48 of the Gas NIC Governance Document, Disallowed Expenditure includes any funds that must be returned if the Project is halted without Ofgem's permission, any funds that have not been spent in accordance with the approved Project Budget contained within the Project Direction, and any unspent funds on the completion of the Project.

6. APPROVED AMOUNT FOR THE PROJECT

The Approved Amount is £5,674,505.03.

7. PROJECT BUDGET

The Project Budget is set out in Annex 1 to this Project Direction. The Funding Licensee must not spend more than 110% of any category total (e.g. "Labour") in Annex 1 without the Authority's prior written consent (such consent is not to be unreasonably withheld).

The Funding Licensee will report on expenditure against each line under the category total in the Project Budget, and explain any projected variance against each line total in excess of 5% as part of its detailed report which will be provided at least every six months, in accordance with paragraph 8.17 of the Gas NIC Governance Document. Ofgem will use the reported expenditure and explanation to assess whether the funding has been spent in accordance with the Gas NIC Governance Document and with this Project Direction.

For the avoidance of doubt this reporting requirement does not change or remove any obligations on the Funding Licensee with respect to reporting that are set out in the Gas NIC Governance Document.

8. PROJECT IMPLEMENTATION

The Funding Licensee must undertake the Project in accordance with the commitments it has made in the Full Submission approved by the Authority pursuant to the Gas NIC Governance Document and with the terms of this Project Direction. These include (but are not limited to) the following:

- (i) undertake the Project in accordance with the description set out in Section 2 (Project Description);
- (ii) provide a Network Licensee Compulsory Contribution of £630,500.56;
- (iii) complete the Project on or before the Project completion date of 26 November 2018; and
- (iv) disseminate the learning from the Project at least to the level described in Section 5 (Knowledge Dissemination).

9. PROJECT PROGRESS THROUGH PHASES

The Funding Licensee must satisfy itself that the successful delivery reward criteria ("SDRC") for each phase have been complied with before using funding for each subsequent phase. The Funding Licensee must secure appropriate internal senior sign-off before proceeding to the next phase and publish this internal sign off no later than when submitting to Ofgem the next detailed report due in accordance with paragraph 8.17 of the Gas NIC Governance Document.

The SDRC relating to each phase (9.1 to 9.8) are detailed in Table 3 of this Project Direction. The funds relating to each phase are identified in Table 2 below.

Table 2. Project budget by phase

Phase	Budget
9.1 Solution Development	£1,671,218.19
9.2 Development Testing	£2,171,165.75
9.3 Offline Trials	£650,168.75
9.4 Online Trials	£614,519.36
9.5 Delta Proto-type	£552,846.34
9.6 Data Analysis Systems	£237,568.16
9.7 Conduct Data Analysis	£189,709.54
9.8 Implement into Business As Usual	£217,809.50

10. REPORTING

Ofgem will issue guidance (as amended from time to time) about the structure and content of the reports required by paragraph 8.17 of the Gas NIC Governance Document. The Funding Licensee must follow this guidance in preparing the reports required by paragraph 8.17 of the Gas NIC Governance Document.

As required by paragraph 8.22 of the Gas NIC Governance Document, the Funding Licensee must inform the Authority promptly in writing of any event or circumstance likely to affect its ability to deliver the Project as set out in its Full Submission.

11. COST OVERRUNS AND DIRECT BENEFITS

The maximum amount of Discretionary Funding that the Funding Licensee can request as additional funding for cost overruns relating to the Project is 5% of the Approved Amount.⁶

12. INTELLECTUAL PROPERTY RIGHTS (IPR)

In Section 5 of its Full Submission (Knowledge Dissemination) the Funding Licensee has stated that the Project does conform to the default IPR arrangements set out in chapter 9 of the Gas NIC Governance Document and must therefore undertake the Project in accordance with the default IPR arrangements.

13. SUCCESSFUL DELIVERY REWARD CRITERIA

The Project will be judged by the Authority for the purposes of the NIC Successful Delivery Reward against the Successful Delivery Reward Criteria set out in Table 3 below (that comply with paragraphs 5.26-5.29 of the Gas NIC Governance Document).⁷

Table 3. Successful Delivery Reward Criteria

Successful Delivery Reward criterion	Evidence
(9.1) Solution Development completed by 30 October 2015: <ul style="list-style-type: none">- a concept design study of robotic platform completed and scope clearly defined;- created and validated 3D models for each trial site accurately representing pipework configuration;- designed a launch and retrieval device to allow robot insertion into high pressure;- robotic platform conceptual design(s) completed, computer models and 3D prints produced, conceptual design(s) demonstrates potential to achieve objectives of travelling 100m around 2 bends taking visual readings and wall thickness measurements in buried pipework of up to 100Barg pressure.	<p>A report will be submitted by 30 October 2015 demonstrating that these measurable activities have taken place.</p> <p>Documentation for SDRC 9.1 uploaded to the internal sharepoint site and project file, external version uploaded to website.</p> <p>Publish evidence of internal senior sign-off confirming successful completion of SDRC 9.1 no later than 19 December 2015.</p>
(9.2) Development Testing completed by 9 September 2016: <ul style="list-style-type: none">- robot access and inspection routes for all three trial sites development and validated including the formulation of Formal Process Safety Assessments;- the offline testing facility designed and distributed for competitive tender. Contract in place for its completion;- manufacture of a robotic platform primary	<p>A report will be submitted by 9 September 2016 demonstrating that these measurable activities have taken place.</p> <p>Documentation for SDRC 9.2 uploaded to internal sharepoint site and project file, external version uploaded to website.</p>

⁶ This is the amount requested by the Funding Licensee in its Full Submission.

⁷ These are the Successful Delivery Reward Criteria set out in the Funding Licensee's Full Submission, with the additional evidence of internal senior sign-off added by Ofgem in accordance with the conditions in this Project Direction.

Successful Delivery Reward criterion	Evidence
<p>solution in order to test and further develop robotic design and meet the objectives of withstanding pressure of up to 100Barg whilst travelling 100m, negotiating two bends and taking visual and wall thickness measurements. This will involve successful bench testing (simulation) in a controlled environment of up to 6m with one bend;</p> <ul style="list-style-type: none"> - launch and retrieval device manufactured to withstand pressure of 100Barg and minimise venting. 	<p>Publish evidence of internal senior sign-off confirming successful completion of SDRC 9.2 no later than 19 December 2016.</p>
<p>(9.3) Successful Offline trials completed by 30 April 2017:</p> <ul style="list-style-type: none"> - offline test rig manufactured and positioned at readiness to conduct offline trials; functional robotic platform manufactured and tested on offline testing facility to conduct visual inspection and wall thickness measurements – a minimum of 10 offline tests will take place; - establish and publish Disaster Recovery Plan for live trial sites; - successful data collection/problem identification by robotic platform in response to test scenarios. 	<p>A completion report will be submitted by 30 April 2017 which will ensure the online trials at the specified live sites: Bacton, Hatton and Lupton, can begin.</p> <p>Documented evidence that robotic platform can negotiate measurables for SDRC 9.3 via project website.</p> <p>Publish evidence of internal senior sign-off confirming successful completion of SDRC 9.3 no later than 19 June 2017.</p>
<p>(9.4) Successful Online trials completed by 30 September 2017:</p> <ul style="list-style-type: none"> - successful insertion of launch and retrieval device into all three live sites; - undertake testing to deliver a functional robotic platform and associated tools to work up to 100Barg pressure, travel 100m, conduct visual inspection and wall thickness measurements – a minimum of 3 online tests per site will take place. 	<p>A completion report will be submitted by 30 September 2017.</p> <p>Document evidence that robotic platform can negotiate measurables for SDRC 9.4 via project website. Publication of successful site mapping on website and recorded in project file.</p> <p>Publish evidence of internal senior sign-off confirming successful completion of SDRC 9.4 no later than 19 December 2017.</p>
<p>(9.5) Delta Proto-type completed by 26 March 2018:</p> <ul style="list-style-type: none"> - Successfully complete testing to deliver a functional robotic platform to work in 100Barg pressure, travel 100m and negotiate two bends, providing condition assessment data (visual and wall thickness measurements) – A minimum of 10 offline tests; - successfully complete testing to deliver 	<p>A report will be completed and submitted by 26 March 2018.</p> <p>Publish that robotic platform has achieved measurables for SDRC 9.5 via project website and documented in project life.</p> <p>Publish evidence of internal senior sign-off confirming successful</p>

Successful Delivery Reward criterion	Evidence
functional robotic platform to work in 100Barg pressure, travel 100m and negotiate two bends, providing condition assessment data – a minimum of three online tests.	completion of SDRC 9.5 no later than 19 June 2018.
<p>(9.6) Data analysis systems in place by 6 July 2018:</p> <ul style="list-style-type: none"> - an analysis of data collected by PIE; - condition assessment algorithms derived by PIE; - a site condition has been developed; - condition assessment criteria for high pressure installations has been established. 	<p>Data analysis will be documented in project file and published on external website, detailing that the measurables for SDRC 9.6 have been achieved.</p> <p>Publish evidence of internal senior sign-off confirming successful completion of SDRC 9.6 no later than 19 December 2018.</p>
<p>(9.7) Completion of data analysis and Stage 4 by 3 September 2018:</p> <ul style="list-style-type: none"> - review of all algorithms to determine changes to the required inspection equipment. 	<p>A data analysis completion report will be submitted by 3 September 2018.</p> <p>A report for the end of stage 4 will be produced and signify the successful delivery of condition assessment via robotic data collection and algorithm utilisation.</p> <p>Publish evidence of internal senior sign-off confirming successful completion of SDRC 9.7 no later than 19 December 2018.</p>
<p>(9.8) Implement into Business As Usual completed by 12 November 2018:</p> <ul style="list-style-type: none"> - Design and manufacture and deliver a pre-commercialised in line inspection platform. - Specifications 100% complete check and approved for the platform that are acceptable by National Grid as specifications suitable for company use. - Deliver an agreed mobilisation strategy to NGGT including training package for all future operators. - Operating procedures (including health and safety) written and published on project website and recorded in project file. The robotic platform to be included as standard operating practise within NGGT asset management policy. 	<p>A report will be submitted by 12 November 2018 demonstrating that the measurable for SDRC 9.8 have been achieved.</p> <p>Publish evidence of internal senior sign-off confirming successful completion of SDRC 9.8 no later than 19 December 2018.</p>

The maximum amount of the Gas NIC Successful Delivery Reward (which will not exceed the Network Licensee Compulsory Contribution) that the Project will be eligible for is £630,500.56.

14. USE OF LOGO

The Funding Licensee and Project Partners, External Funders and Project Supporters may use the NIC logo for purposes associated with the Project but not use the Ofgem or Ofgem E-Serve logos in any circumstances.⁸

15. AMENDMENT OR REVOCATION

As set out in the Gas NIC Governance Document and this Project Direction, this Project Direction may be amended or revoked under the following circumstances:

- (i) if the Funding Licensee considers that there has been a material change in circumstance that requires a change to the Project Direction, and the Authority agrees (paragraph 8.23 of the Gas NIC Governance Document); and/or
- (ii) if Ofgem agrees to provide Contingency Funding, which requires the re-issue of the Project Direction (paragraph 8.42 of the Gas NIC Governance Document); and/or
- (iii) if the Funding Licensee applies for Discretionary Funding to cover a decrease in Direct Benefits and the Authority decides it would be in the best interest of customers to make changes to the Project Direction before the Discretionary Funding would be awarded (paragraph 8.42 of the Gas NIC Governance Document).

16. HALTING OF PROJECTS

This Project Direction is subject to the provisions contained in paragraphs 8.30 to 8.34 of the Gas NIC Governance Document relating to the halting of projects. By extension, this Project Direction is subject to any decision by the Authority to halt the Project to which this Project Direction relates and to any subsequent relevant Funding Direction issued by the Authority pursuant to Special Condition 2F.

In the event of the Authority deciding to halt the Project to which this Project Direction relates, the Authority may issue a statement to the Funding Licensee clarifying the effect of that halting decision as regards the status and legal force of the conditions contained in this Project Direction.

NOW THEREFORE:

In accordance with the powers contained in the Gas NIC Governance Document issued pursuant to Part E of Special Condition 2F of the Licence the Authority hereby issues this Project Direction to the Funding Licensee in relation to the Project.

This Project Direction constitutes notice of reasons for the Authority's decision pursuant to section 38A of the Gas Act 1986.

⁸ As listed in Box 1.5 in Section 1 of the Full Submission pro-forma.

ANNEX 1: PROJECT BUDGET

Cost Category	Cost
Labour	£1,047,955.91
Equipment	£141,773.00
Contractors	£5,069,776.68
IT	0
IPR Costs	0
Travel & Expenses	£45,500.00
Payments to users	0
Contingency	0
Decommissioning	0
Other	0
Total	£6,305,005.59