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for energy consumers

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Date: 21 September 2016

Dear Jon,

Network Innovation Competition (NIC) – amendments to the Project Direction for National Grid Gas Transmission’s (NGGT’s) Gas Robotic Agile Inspection Device (GRAID) project

The NIC funds a number of large-scale innovation projects and was set up to encourage network licensees to innovate in the design, development, and operation of their networks.

The purpose of the GRAID NIC project is to develop a robot that can enter below ground gas pipework and inspect it to find out the true condition of these assets.

NGGT wish to amend the Project Direction to facilitate the following: a reallocation of funds from one cost category to the other; change the timing of a Successful Delivery Reward Criteria (SDRC); add a voluntary contribution from NGGT to the project budget; and change some of the locations for the live trials.

This letter contains our¹ decision to approve requested amendments to certain sections of the Project Direction² dated 19 December 2014 for NGGT’s GRAID project (the project). The amendments we are approving are set out in the amended Project Direction in the schedule to this letter.

Background

On 19 December 2014, we issued a Project Direction³ to you under the Gas NIC Governance Document⁴. The Project Direction contains the terms to be followed in relation to the project as a condition of it being funded under the NIC.⁵

On 26 July 2016, you asked us to make changes to the Project Direction (the change request).⁶ The amendments relate to two areas:

¹ The terms ‘we’, ‘us’, ‘our’ refer to the Gas and Electricity Markets Authority. Ofgem is the office of the Authority.

The terms ‘you’ and ‘your’ are used to refer to National Grid Gas Transmission.

² All capitalised terms not otherwise defined in this letter have the meaning given to them in the Project Direction.

³ https://www.ofgem.gov.uk/sites/default/files/docs/2015/01/nggt_project_direction.pdf

⁴ <https://www.ofgem.gov.uk/ofgem-publications/56867/gas-nic-governance-document.pdf>

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

⁶ NGGT’s change request is published alongside this letter.

- 1) Changing the project budget; and
- 2) Amendments to the Successful Delivery Reward Criteria.

The rest of this letter contains a summary of the proposed changes and our decision to approve the changes requested.

1: Changing the project budget

This change request proposes amending three elements of the project budget. The first change being requested relates to an additional voluntary contribution from NGGT of £243k to the offline test facility. This increases the total project budget by 4% and appears in the 'contractors' cost category.

The second change requested to the budget is to move £112k of the budget from the 'labour' cost category to the 'contractors' cost category. This is because of NGGT's proposed change of plan to conduct offline trials in DNV GL's RAF Spadeadam site instead of NGGT's Ambergate site. This change request is not considered to alter the work programme deliverables and would only be a change in who will be undertaking the work.

The third change requested by NGGT is, as a consequence of the above, to the 'Project budget by phase' table contained in the Project Direction at Table 2. The change is to the 'Budget' column and is to keep the table up-to-date to reflect the increased budget and re-phasing of funds between SDRCs.

We have considered these proposed changes to the project budget, and conclude that there are no substantive changes to the project's deliverables. We agree with your approach to restructure the budget and add an additional voluntary contribution from your side instead of seeking increases in the NIC approved amount.

We consider that the proposed change to the 'Budget' column of Table 2 is not, however, needed. Instead we will remove the whole of the 'Budget' column because it is unlikely to remain up-to-date over the duration of the project. The change does not impact the purpose of the Project Direction requirements linked to Table 2, which is for NGGT to have internal sign-off before proceeding to the next phase of the project.

Schedule one below sets out the necessary changes to the Project Direction.

Change 2: Amendments to the SDRC

The change request proposes two changes to the SDRC:

1) NGGT wishes to extend the development time for the launch vessel⁷ because of its increased interdependence with the design of the robot. The change request keeps the deliverable the same but moves it 8 months later from SDRC 9.2 (development testing) to 9.3 (offline trials). NGGT concluded that this is a more natural fit for this deliverable.

2) NGGT has requested a change in the trial sites, replacing Hatton and Lupton with Aylesbury and Cambridge. Following a risk assessment of the sites by NGGT, it is felt that changing the sites can produce more valuable inspection data for the project because of the more suitable, older pipework.

Based on our assessment of the change request we agree to the proposed changes to the SDRC. The changes would not alter the project deliverables and we see value in using trial sites that could generate more valuable inspection data.

⁷ This is a device that will be connected to a suitable section of the pipework, from which the robot will enter the pipework guided by a cable 100 metres long. This will be guided by the Umbilical Management System (UMS), which facilitates loading and unloading of the robot from the launch vessel.

Schedule one below sets out the necessary changes to the Project Direction to reflect our approval of the changes being requested.

Decision

We consider that, with the proposed amendments contained in your change request, you will still deliver the expected benefits and outcomes outlined in the Full Submission and that these amendments are in the interests of customers to enable the project to continue.

Our assessment in this letter does not in any way fetter our discretion with respect to any future decision on the Successful Delivery Reward, should you make a submission after the completion of the project.

In accordance with Section 15 of the Project Direction, we hereby amend the Schedule to the Project Direction in the manner set out in Schedule one to this letter. This letter constitutes notice of reasons for our decision pursuant to section 38A of the Gas Act 1986.

If you would like to discuss any of the issues raised in this letter, please contact Mahamid Ahmed at Mahamid.Ahmed@ofgem.gov.uk or 020 7901 3942.

Yours sincerely,



Geoffrey Randall
Head of RIIO, Electricity Transmission
For and behalf of the Authority

Schedule 1 –Project Direction changes

This change request proposes that the following changes are made to the Project Direction:

9. PROJECT PROGRESS THROUGH PHASES

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

Table 2. Project phases

Phase	Budget
9.1 Solution Development	£1,340,910.46
9.2 Development Testing	£1,978,518.25
9.3 Offline Trials	£1,601,626.30
9.4 Online Trials	£425,257.98
9.5 Delta Proto-type	£430,529.58
9.6 Data Analysis Systems	£258,237.63
9.7 Conduct Data Analysis	£241,332.34
9.8 Implement into Business As Usual	£271,358.00

13. SUCCESSFUL DELIVERY REWARD CRITERIA

Table 3. Successful Delivery Reward Criteria

Successful Delivery Reward criterion	Evidence
(9.1) Solution Development completed by 30 October 2015: - 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	A report will be submitted by 30 October 2015 demonstrating that these measurable activities have taken place. Documentation for SDRC 9.1 uploaded to the internal sharepoint site and project file, external version uploaded to website. Publish evidence of internal senior sign-off confirming successful completion of SDRC 9.1 no later than 19 December 2015.

<p>visual readings and wall thickness measurements in buried pipework of up to 100Barg pressure.</p>	
<p>(9.2) Development Testing completed by 9 September 2016:</p> <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 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>– launch and retrieval device manufactured to withstand pressure of 100Barg and minimise venting.</p>	<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> <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 	<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 Bacton, Aylesbury and Cambridge 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>identification by robotic platform in response to test scenarios.</p> <p>- launch and retrieval device manufactured to withstand pressure of 100Barg and minimise venting.</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 functional robotic platform to work in 100Barg pressure, travel 100m and negotiate two bends, providing condition assessment data – a minimum of three online tests. 	<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 completion of SDRC 9.5 no later than 19 June 2018.</p>
<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; 	<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>- condition assessment criteria for high pressure installations has been established.</p>	
<p>(9.7) Completion of data analysis and Stage 4 by 3 September 2018:</p> <p>- review of all algorithms to determine changes to the required inspection equipment.</p>	<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> <p>- Design and manufacture and deliver a pre-commercialised in line inspection platform.</p> <p>- Specifications 100% complete check and approved for the platform that are acceptable by National Grid as specifications suitable for company use.</p> <p>- Deliver an agreed mobilisation strategy to NGGT including training package for all future operators.</p> <p>- 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>	<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>

ANNEX 1: PROJECT BUDGET

Cost Category	Cost
Labour	£1,047,955.91 £936,061.38
Equipment	£141,773.00
Contractors	£5,069,776.68 £5,424,436.16
IT	£0.00

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IPR Costs	£0.00
Travel & Expenses	£45,500.00
Payments to Users	£0.00
Contingency	£0.00
Decommissioning	£0.00
Other	£0.00
TOTAL	£6,305,005.59 £6,547,770.55