

Company Secretary Scottish Hydro Electric Transmission Plc Inveralmond House 200 Dunkeld Road Perth Perthshire PH1 3AQ

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Date: 19 December 2013

Dear Company Secretary,

Project Direction ref: SHE Transmission/Multi Terminal Test Environment for HVDC Systems / 19/12/13

Scottish Hydro Electric Transmission Plc (SHE Transmission) submitted the project 'Multi Terminal Test Environment for HVDC Systems' (MTTE) on 9 August 2013 to be considered for funding through the Electricity Network Innovation Competition (NIC). In this year's decision¹, we selected the project for funding.

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

Project direction

Paragraph 5.66 of the Electricity NIC Governance Document states that a Project Direction must:

- 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;
- 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

¹ <u>https://www.ofgem.gov.uk/publications-and-updates/decision-first-year-electricity-network-innovation-competition</u>

• the mechanism for the Network Licensee receiving the Approved Amount is set out in the Funding Direction.

These are described for MTTE in the schedule to this condition.

Decision

Provided SHE Transmission complies with the NIC Governance Document and the schedule to this Project Direction, MTTE is deemed to be an Eligible NIC Project².

This Project Direction constitutes notice pursuant to section 49A (Reasons for decisions) of the Electricity Act 1989.

Dora Guzeleva Head Networks Policy: Local Grids **For and on behalf of the Authority**

² Eligible NIC Project has the meaning given in definitions of the Electricity Transmission licence.

1. TITLE

Project Direction ref: <u>SHE Transmission/Multi Terminal Test Environment for HVDC</u> Systems/19/12/13

2. PREAMBLE

This Project Direction issued by the Gas and Electricity Markets Authority (the "Authority") to Scottish Hydro Electric Transmission Plc (the "Funding Licensee") pursuant to the Electricity NIC Governance Document issued pursuant to Part E of Special Condition 3I (Network Innovation Competition) of the Electricity Transmission Licence (the "Licence") sets out the terms to be followed in relation to Multi Terminal Test Environment for HVDC Systems (the "Project") as a condition of it being funded under the NIC and the Funding Return Mechanisms³.

Unless otherwise specified, defined terms in this Project Direction are defined in Appendix 1 of the Electricity 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's Full Submission pro-forma.

For the avoidance of doubt, in this Project Direction, the term "multi-terminal" has the meaning as defined in the Full Submission.

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. CONDITIONS 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 that commit the Project Partners to co-operating with the Funding Licensee to meet the Funding Licensee's obligations under this Project Direction.

Table 1 Condition Precedent 1

National Grid Electricity Transmission Plc in its role as a GB transmission owner National Grid Electricity Transmission Plc in its role as operator of the GB Transmission System. SP Transmission Limited

5. COMPLIANCE

The Funding Licensee must comply with Special Condition 3I and the NIC Governance Document (as may be modified from time to time in accordance with Special Condition 3I and as modified and/or augmented in respect of the Project by this Project Direction) and the Project Direction.

³ the Funding Return Mechanism is defined in part C of Special Condition 3I.

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

Pursuant to Special Condition 3I.8. 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 Electricity NIC Governance Document or those of the relevant Project Direction.

Pursuant to paragraph 8.48 of the Electricity NIC Governance Document, Disallowed Expenditure includes any funds that must be returned if the Project is halted without Ofgem's⁴ permission, any funds that have not been spent in line 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 £ 11,332,801.

7. PROJECT BUDGET

The Project Budget is set out in Annex 1. The Funding Licensee must not spend more than 110% of any category total (e.g. "Labour") in Annex 1 without the Authority's prior 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 Electricity NIC Governance Document. Ofgem will use the reported expenditure and explanation to assess whether the funding has been spent in accordance with the Electricity NIC Governance Document or 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 Electricity 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 Electricity NIC Governance Document and the terms of this Project Direction. These include (but are not limited to) the following:

- undertake the Project in accordance with the description set out in Section 2 (Project Description);
- (ii) provide a Network Licensee Compulsory Contribution of £1,339,391;
- (iii) complete the Project on or before the Project completion date of 31 March 2021; and
- (iv) disseminate the learning from the Project at least to the level described in Section 5 (Knowledge Dissemination).

9. ENGAGEMENT WITH HVDC EQUIPMENT SUPPLIERS

⁴ Ofgem is the offices of the Gas and Electricity Markets Authority. The terms 'Ofgem' and 'Authority' are used interchangeably in this Project Direction.

The Funding Licensee will be responsible for developing and delivering an approach to ensure the ongoing participation of at least two of the parties described in Table 2 ("HVDC suppliers"). The Funding Licensee will also be responsible for protecting customers' investment in the project against the risk of non-participation of the HVDC suppliers.

As part of discharging this responsibility, the Funding Licensee will submit an application to the Authority providing evidence that it has established appropriate contractual and other arrangements to:

- A) ensure the ongoing participation of the HVDC suppliers; and
- B) protect customers' investment against the risk of non-participation of the HVDC suppliers.

The Funding Licensee must submit an application to the Authority providing evidence that the arrangements that it has entered into with the HVDC suppliers, either directly or through engagement with HVDC transmission project or its Project Partners ("the arrangements"), are sufficiently robust that it is appropriate to move to full procurement, construction and operation of the MTTE facility. It will do this by demonstrating that the arrangements ensure that the HVDC suppliers will -

- allow the replica HVDC control panels (panels procured via suitably authorised HVDC projects) to be installed at the MTTE facility.
- participate in developing the studies and scenarios to be tested in the MTTE facility.
- as part of its provision of replica panels to HVDC transmission project(s), include the provision of appropriately trained staff to manage the installation of its equipment and support its commissioning and operation during the test programme.
- agree terms in respect of the security arrangements (cyber and physical) that the Funding Licensee will provide within and around the MTTE facility. This would encompass the control of access to hardware, software and the dissemination of intellectual property between all parties using the MTTE facility. Such terms would include arrangements in respect of accidental and non-accidental damage or loss arising from the operation of the MTTE facility and or as otherwise agreed between the contracting parties.
- conform to the default IPR arrangements as specified in chapter nine of the NIC Governance document (or gain approval from Ofgem for any required deviations to protect foreground IPR).

In addition, in making this application the Funding Licensee must demonstrate the arrangements protect customers against the consequential cost of non-participation of the HVDC suppliers.

The Authority will consider this application and determine if the Funding Licensee may commence with the full procurement, construction and operation of the MTTE facility. During this consideration the Authority may request further information from the Funding Licensee. The application must be made by the end of December 2014. It will be considered by the Authority and our decision will be made as soon as practicable and by no later than 3 months from the date of submission of the application. If the measures and mitigations set out within the application are not considered to be sufficiently robust the Authority may either:

- A) Halt the MTTE project as per paragraphs 8.30-8.34 of the Governance document; or
- B) Indicate its intention to amend the Project Direction to include further requirements to fully protect customers' investment in the MTTE Project. Such requirements may make provision for the Authority to disallow Project Expenditure incurred beyond

December 2014 if - as a consequence of the actions of the Funding Licensee, a Project Partner, a Project Participant or any party referred to in this Project Direction - any phase of the MTTE project is prevented from happening or is unreasonably delayed.

Any requirements will be shared with the Funding Licensee in draft, allowing dialogue through which the Funding Licensee may propose amendments. The Funding Licensee will then have 5 working days (from issue of the final requirements) to confirm whether it would like to continue with the MTTE Project with these additional requirements. Once confirmation is received, the Authority would amend the Project Direction. If the Funding Licensee fails to provide this confirmation, the Authority would halt the MTTE project and instruct the return of all uncommitted funds in the project bank account to customers.

The Funding licensee accepts that if the HVDC supplier fails to supply the replica control panels (and no suitable alternative can be sourced) that they will not be eligible for the Successful Delivery Reward.

Table 2 – HVDC Suppliers

ABB Limited Alstom Grid UK Siemens Transmission & Distribution Ltd

or appropriate associated legal entity of one of these companies

10. ENGAGEMENT WITH A MULTI-TERMINAL SCHEME

The Funding Licensee must meet the requirement of either Part 1 or Part 2 of this provision. The Funding Licensee must inform the Authority that Part 1 has been met or submit a notice under Part 2 by the end of December 2014.

Part 1

The Funding Licensee must enter into contractual agreements (or, in the case of SHE Transmission, other suitable evidence of commitment to use MTTE) with at least one of the parties described in Table 3 ("contracting parties"). The contractual agreement it enters into with the contracting party must include terms which stipulate that the contracting party -

- must provide the replica control panels that it procures through its HVDC project to the MTTE project for testing.
- where appropriate, provide its generation output models to be held and used as part of testing carried out by the Project.
- accepts the adequacy of the arrangements for site security (cyber and physical) that the Funding Licensee commits (through the contract) to put in place within and around the MTTE facility. This would encompass the control of access to hardware, software and the dissemination of intellectual property between all parties using the MTTE facility.
- will conform to the default IPR arrangements as specified in chapter nine of the NIC Governance document (or gain approval from Ofgem for any required deviations to protect foreground IPR).

Table 3

- i) One or more wind farm developers holding a Crown Estates Round 3 Zone Development Agreement developing a multi-terminal HVDC scheme; or
- ii) One or more GB transmission licensee, or group of licensees, developing a multi-terminal HVDC scheme.

In either case (i) or (ii), the party must have made a full, and evidenced, financial commitment to developing its HVDC transmission project as a multi terminal scheme.

Part 2

The Funding Licensee must submit an application to the Authority indicating that it believes that the provision of replica control panels from an HVDC transmission scheme (which is either multi-terminal, or which has the potential to become multi-terminal) can be expected and, as such, it now considers that it is appropriate to move to full procurement, construction and operation of the MTTE facility.

In making this application the Funding Licensee must:

- Set out the HVDC project, or projects, that it considers will be built as multi terminal HVDC schemes.
- Explain any agreements that it has in place with the developer(s) of that scheme(s).
- Provide the evidence that has informed its view that the transmission project(s) will eventually be built as a multi terminal HVDC scheme(s) and highlight any risk that the scheme(s) may not proceed on a multi terminal HVDC basis.

The Authority will consider this application and determine if the Funding Licensee may commence with the full procurement, construction and operation of the MTTE facility. During this consideration the Authority may request further information from the Funding Licence.

The application would be considered by the Authority and our decision would be made as soon as practicable and by no later than 3 months from the date of submission of the application.

In making its decision on the Funding Licensee's application, the Authority may indicate its intention to introduce further requirements to fully protect customers' investment in the MTTE Project. Such requirements may make provision for the Authority to disallow Project Expenditure incurred beyond December 2014 if - as a consequence of the actions of the Funding Licensee, a Project Partner, a Project Participant or any party referred to in this Project Direction - any phase of the MTTE project is prevented from happening or is unreasonably delayed.

Any requirements will be shared with the Funding Licensee in draft, allowing dialogue through which the Funding Licensee may propose amendments. The Funding Licensee, would then have 5 days (from issue of the final requirements) to confirm whether it would like to continue with the project with these additional requirements. If confirmation is received, the Authority would made amendment to the Project Direction. If the Funding Licensee fails to provide this confirmation, the Authority would halt the project and instruct the return of all uncommitted funds in the project bank account to customers.

11. RESTRICTED PROJECT BUDGET

Prior to the Authority's decision in respect of clause 9 - ENGAGEMENT WITH HVDC EQUIPMENT SUPPLIERS and the Funding Licensee satisfying either Part 1 or Part 2 of clause 10 - ENGAGEMENT WITH A MULTI-TERMINAL SCHEME the Funding Licensee must not spend any of the project budget other than the amounts given below, for the purposes specified:

- Up to £136,500 on RTS specification and IT Infrastructure requirements specification and design (incl. cyber security);
- Up to £142,900 on Building/facility requirements specification and design (incl. physical security);
- Up to £57,800 on Engagement of HVDC Suppliers, HVDC projects and creating the associated legal agreements, and Collaboration Agreements with academic institutions;
- Up to £69,000 on Project Management & Governance;
- Up to £50,500 on Learning & Dissemination (knowledge capture plan, dissemination plan, external presentations, engagement event(s) etc.);
- Up to £59,900 on Developing the studies and activities programme;
- Up to £70,800 on SPT, NGET, OFTO and NETSO Collaboration;
- Up to £2,400 on MTTE Recruitment & Training;
- Up to £23,600 on MTTE Operations: develop how the MTTE will function, legal frameworks, ownership and management etc. and
- Up to £26,700 on Expenses (travel etc.).

The Funding Licensee will minimise the total cost incurred against each of these categories. The Authority may Audit these costs ex post to ensure that they have been incurred efficiently and only for the purpose of meeting the requirements of clauses 9 and 10 of this Project Direction.

12. ENHANCED PROJECT PLAN AND PROGRESS REPORT

As part of its first Sixth Monthly report, the Funding Licensee must provide:

- an update on its progress in meeting additional provisions 9 and 10 of this Project Direction.
- an enhanced version of its project plan, identifying progress on major cost items.

13. THE FUTURE USE OF THE MTTE FACILITY

The Funding Licensee must, prior to 1 January 2020, submit a Notice to the Authority setting out its proposal for the future use of the MTTE facility following the Project's End Date. As part of the Notice, the Funding Licensee must explain how the approach will maximise future value to all customers (including those of the other transmission licensees).

The Authority will determine whether to approve the Notice or direct alternative arrangements, this decision will be made as soon as practicable and by no later than 6 months from the date of submission of the Notice. The Authority may consult on the Funding Licensee's proposal and any alternatives that it considers appropriate.

The Funding licensee accepts that any net profits it receives from the potential sale or ongoing operation of the MTTE facility will be returned to customers in full. The Funding licensee accepts to ensure that the proceeds it secures from the sale or operation of the MTTE facility reflect the principle of maximising future value to all customers (including those of the other transmission licensees).

14. 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 Electricity NIC Governance Document. The Funding Licensee must follow this guidance in preparing the reports required by paragraph 8.17 of the Electricity NIC Governance Document.

As required by paragraph 8.22 of the Electricity 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.

15. COST OVERUNS & DIRECT BENEFITS

The maximum amount of Discretionary Funding that the Funding Licensee can request as additional funding for cost overruns on the Project is $0\%^5$.

The maximum amount of Discretionary Funding that the Funding Licensee can request as additional funding for a shortfall in Direct Benefits on the Project is 50%⁶.

16. INTELLECTUAL PROPERTY RIGHTS (IPR)

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

17. 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 5^7 below (that comply with paragraphs 5.26 – 5.29 of the Electricity NIC Governance Document).

Table 5. Successful Delivery Reward Criteria

Successful Delivery Reward criterion	Evidence
9.1 Formal Agreement with Project Partners. The success of this project will be crucially dependent on the involvement of the project partners & stakeholders. Therefore, an early indication of success of the project is the establishment of formal agreements with the project partners (National Grid, Scottish Power and NETSO) and HVDC expert support.	9.1.1 Signed agreements with project partners (National Grid, Scottish Power and the NETSO)(note, agreement will include IP security requirements) and HVDC expert support by end of August 2014.

⁵ This is the amount requested by the Funding Licensee in its Full Submission.

 $^{^{\}rm 6}$ 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 Licensees Full Submission

9.2 OFTOs and Renewable Developers Event Given the anticipated number of HVDC schemes in GB for connection of offshore renewable, the engagement of OFTOs and Renewable Generators is important to ensure the benefits of the MTTE are maximised, therefore the MTTE project will hold an event to inform and encourage their participation.	9.2.1 Holding an event to which all OFTOs and Renewable Generators are invited, to inform and encourage their participation in the MTTE by end of October 2014.
9.3 Engagement with 1st HVDC Project The purchase of the 1 st set of replica control panels for the MTTE will be key to its success, and the panels will be purchased through an HVDC project. Therefore the formal engagement of the initial HVDC project is an important early milestone.	9.3.1 Formal agreement between the MTTE project and an HVDC project, which includes the intention to purchase/supply replica control panels through the HVDC project's procurement process; by December 2014.
9.4 Complete Design of MTTE Facility The completed design of the MTTE facility, both technical design and physical design, and the agreement of this design with the project stakeholders (including vendors), is a key milestone for the project. The detailed design will be consolidated within the Design Development Document, and will adhere to the requirements defined in the requirements specification.	9.4.1 Design development document and requirements specification for the MTTE facility endorsed by participating vendors and signed-off by SHE Transmission, NGET, NETSO and SPT by end of May 2015.
9.5 Establishing HVDC Operators' Forum and Website A key component of our knowledge and dissemination strategy is the establishment of the HVDC Operators' Forum (to which all Network Licensees, including OFTOs will be invited), the associated members' website (which provides a secure area to share the MTTE outputs with Transmission Licensees), and the public website.	9.5.1 The establishment of the HVDC Operators' Forum (including holding the 1 st event), together with the publishing of the MTTE websites by end of October 2015.

 9.6 Commence Operation of the MTTE The criteria consolidates the: Completion of the building/upgrade of the MTTE facility; Commissioning of the IT/RTS infrastructure; MTTE Resourcing; Management structure in place; Processes and procedures agreed; Data sets of the AC network received (from NETSO); and Plan of studies and tests agreed. When all of these are in place, the MTTE will be able to commence operations, therefore this is a key milestone and measure of success of the project.	9.6.1 Commencement of MTTE Operations by end of May 2017.
9.7 Publishing Studies & Test results The key outputs from the MTTE are the reports on specific scenarios which are completed within the MTTE, which will be disseminated to transmission licensees. Therefore, a key success criterion is the publishing of studies or test reports on the MTTE members' website.	9.7.1 Publishing the first set of reports on a specific Transmission Licensee led project, on the MTTE members' website by end of March 2018.
9.8 Future Business Model At least 12 months prior to the end of the funded operation of the MTTE (i.e. by end of March 2020), the MTTE management team will submit a proposal for the future operation and funding of the MTTE (post NIC funding), to Ofgem.	9.8.1 Submission of proposal regarding MTTE ongoing operation and funding to Ofgem by end of March 2020.

The maximum amount of the NIC Successful Delivery Reward (which will not exceed the Licensee Compulsory Contribution) that the Project will be eligible for is \pounds 1,339,391.

18. USE OF LOGO

The Funding Licensee and Project Partners, External Funders and Project Supporters⁸ may use the NIC logo for purposes associated with the Project but not use the Ofgem or Ofgem E-Serve logos in any circumstances.

19. AMENDMENT OR REVOCATION

As set out in the Electricity 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 Electricity NIC Governance Document); or

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

- (ii) if Ofgem agrees to provide Contingency Funding, which requires the re-issue of the Project Direction (paragraph 8.42 of the Electricity NIC Governance Document); 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 Electricity NIC Governance Document).

20. HALTING OF PROJECTS

This Project Direction is subject to the provisions contained in paragraphs 8.30 to 8.34 of the Electricity 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 3I.15.

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 Direction.

NOW THEREFORE:

In accordance with the powers contained in the Electricity NIC Governance Document issued pursuant to Part E of Special Condition 3I of the Licence the Authority hereby issues this Project Direction to the Funding Licensee in relation to the Project.

This constitutes notice of reasons for the Authority's decision pursuant to section 49A (Reasons for decisions) of the Electricity Act 1989.

ANNEX 1: PROJECT BUDGET

Cost Category	Cost
Labour	
Project team resource costs	£2,181.68k
MTTE resource costs	£2,032.13k
Equipment	
N/A	
Contractors	
Project team resource costs	£288.44k
IT	
IT Infrastructure (incl RTS and Replica Panels)	£3,828.21k
Annual Running Costs of the MTTE	£304.37k
IPR Costs	
N/A	
Travel & Expenses	
Travel & Expenses	£197.40k
Payments to users	
N/A	
Contingency	
N/A	
Decommissioning	
N/A	
Other	
Academic Support	£827.07k
Learning & Dissemination	£165.41k
MTTE Building Facility	£2,916.20k
Annual Running Costs of the MTTE	£515.09k
Recruitment & Training	£137.90k
Total	£13,393.91k