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Dear Company Secretary

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

On 9 August 2013 you (Scottish Hydro Electric Transmission Plc (SHE Transmission)) submitted the project 'Multi Terminal Test Environment for HVDC Systems' (MTTE) for funding through the Electricity Network Innovation Competition (NIC). Following a recommendation from the Expert Panel,¹ we awarded funding for the Project on 29 November 2013, subject to you complying with the Project Direction.²

When making its recommendation, the Expert Panel raised some concerns about the level of HVDC vendor support and participation required for the project to be successful. It recommended that you provide more evidence of engagement with HVDC vendors, backed by engagement with an actual or potential multi terminal³ (MT) project.

As a result, our Project Direction contained two specific conditions that you should satisfy in order to be permitted NIC project funding:²

1. engagement with at least two HVDC equipment suppliers; and
2. engagement with at least one multi terminal scheme.

To satisfy the requirements of these specific conditions, on 29 December 2014 you submitted your application to us. This included evidence and details of how you believed you had met these two specific conditions. We assessed this submission from a policy and technical perspective. We asked a series of supplementary questions and you provided responses. This letter summarises our assessment of your application against both of the specific conditions.

¹ Innovation in networks – Ofgem's Electricity Network Innovation Competition – Decision on first year competition <https://www.ofgem.gov.uk/ofgem-publications/84870/electricitynetworkinnovationcompetition-decisiononfirstyearcompetitiondoc.pdf>

² Project Direction ref: SHE Transmission/Multi Terminal Test Environment for HVDC Systems / 19/12/13, <https://www.ofgem.gov.uk/ofgem-publications/85449/signedmtteprojectdirection.pdf>

³ For the avoidance of doubt, for this assessment we use the definition of "multi-terminal" from SHE Transmission's full Project submission as referred to in our Direction letter. This definition reads, "A multi-terminal HVDC system includes 3 or more terminals".

1. Engagement with at least two HVDC equipment suppliers

i) Ensure the ongoing participation of the HVDC suppliers

The first part of specific condition 1 required you to ensure the ongoing participation of at least two HVDC suppliers. To meet this condition, you had to demonstrate that the commercial arrangements agreed with the HVDC suppliers would ensure that the suppliers:

- allowed replica panels to be installed at the MTTE facility;
- participated in developing the studies and scenarios to be tested in the MTTE facility;
- included the provision of appropriately trained staff;
- agreed terms in respect of the security arrangements (cyber and physical); and
- conformed to the default IPR arrangements as specified in chapter nine of the NIC Governance document.

As evidence for specific condition 1, you provided signed collaboration agreements with the three main European HVDC suppliers: ABB, Alstom and Siemens.

In our assessment, we noted that the collaboration agreements stated that the suppliers would allow the replica panels to be installed in the future. Actual provision would be arranged through separate contracts. In terms of meeting this condition, we are satisfied that the suppliers agree in principle to allow replica panels to be installed.

Alstom was the only supplier to agree in the collaboration agreement to the NIC Governance document IPR arrangements, with the right to request deviations. In our supplementary questions, you confirmed this but assured us that the IPR arrangements with Siemens and ABB would also allow you to comply with the terms of chapter nine of the NIC Governance document.

The evidence you provided shows agreement in principle with at least two HVDC suppliers to meet the first set of requirements of specific condition 1. We therefore consider that the first part of specific condition 1 has been met.

ii) Protect customers' investment against the risk of non-participation of the HVDC suppliers

For the second part of specific condition 1, you described how you are finalising amendments to the main Caithness Moray HVDC contract with ABB. The amendments will ensure the contract includes the provision of replica control panels for the MTTE project. This will tie in the supply of replica panels as part of the main contract and therefore mitigate the risk of ABB not participating. We note that this contract amendment is not yet signed but that finalising it depends on our decision on the MTTE project.

Through supplementary questions, you have confirmed that there are no set plans or specific contracts currently in place to procure panels from the other two suppliers. However, the three collaboration agreements show serious intent by all three suppliers, and tying in ABB mitigates this risk to some extent. We also note the encouragingly high level of interest and support in MTTE from the industry.

We are therefore satisfied that you have met both parts of specific condition 1.

2. Engagement with at least one multi terminal scheme

Specific condition 2 is in two parts. Although you are only required to meet one part of specific condition 2, you submitted evidence for both part 1 and part 2.

Part 1

For part 1, you had to enter into contractual agreements for developing a MT scheme with one or more wind farm developers, or one or more GB transmission licensees, or group of licensees. The specific condition noted that the MT development party had to make a full financial commitment to developing its HVDC project as a MT scheme. You had to provide evidence to confirm this.

You provided a signed memorandum of understanding (MOU) between the Caithness Moray MT-enabled HVDC project, and the MTTE project as evidence for part 1.

The Caithness Moray project is currently being developed as a point to point scheme. Although there is anticipatory investment for extra capacity, partly funding the potential MT scheme, we do not consider this to be full financial commitment to a MT scheme as required by part 1 of this assessment.

Therefore, based on the evidence provided, we do not feel that part 1 of this specific condition has been met.

Part 2

Under part 2, you must indicate that you expect the provision of replica control panels from an HVDC transmission scheme (which is either MT, or which has the potential to become MT). For part 2, you submitted evidence indicating that you expect that the Caithness Moray project has the potential to become MT – most likely due to a potential third link to Shetland.

The first requirement of condition part 2 was to describe the HVDC project, or projects, that will be built as MT HVDC schemes. You provided an independent consultants' report on potential MT HVDC schemes in the UK. This stated that the Caithness Moray project had the potential to become a MT scheme. We consider that this report, combined with additional information provided in response to supplementary questions, meets the first requirement of part 2.

The second requirement was to explain any agreements you had in place around this potential MT project. As evidence of meeting this requirement, you provided a MOU between the Caithness Moray project and the MTTE project. This signed document describes the terms under which both projects agree in principle to work together on the MTTE project at the MTTE facility. We consider this MOU meets the second requirement of part 2.

The third requirement was to provide the evidence for the transmission project(s) eventually being built as a MT HVDC scheme(s) and to highlight any risk that the scheme(s) might not proceed on a MT HVDC basis. You referred to the independent consultants' report on potential MT HVDC schemes in the UK and provided details of the risk that the Shetland link would not go ahead. You also pointed to the Caithness Moray Strategic Wider Works needs case. This includes anticipatory investment for 400MW of additional capacity for a link from Shetland. You considered that the benefit of this investment would be realised once an additional link was built, making the scheme MT. You also provided details of other potential projects which could make the Caithness Moray project MT.

In our decision letter on the Caithness Moray project we said, "The proposed subsea cable includes anticipatory investment to accommodate a future cable link from Shetland. The main anticipatory element included in the proposal is additional capacity (400MW) in the cable from the Caithness coast to the Blackhillock substation in Morayshire (c. £60m

incremental cost). The proposal does not include the cable link to Shetland.”⁴ We also assessed the likelihood of other future offshore renewable projects using the additional capacity funded by the anticipatory investment if the Shetland link did not proceed. We concluded that there was sufficient certainty that this additional capacity would be used in a manner that would make the project MT. We therefore consider that SHE Transmission meets the third requirement of part 2.

We are therefore satisfied that SHE Transmission has met part 2 of specific condition 2.

Funding for replica control panels

Additionally, we assessed project funding in light of changed circumstances relating to the Caithness Moray Project Decision. In particular we considered the item listed in SHE Transmission’s MTTE NIC full submission as the provision, delivery, installation and testing of the first set of replica control panels of £1.5m. We also considered the allowed funding from the Caithness Moray project allocated to the replica hardware and software cost item along with a quote from ABB. We consider the funding from the MTTE project and the funding from the Caithness Moray project to be for the same item, showing potential overfunding.

Our Decision

We have considered your application in accordance with our principal objective and the Project Direction’s specific conditions as described above. We believe you met the requirements of the two specific conditions by providing sufficient evidence that you were engaged with three HVDC equipment suppliers and with a project that will eventually most likely be built as a MT project. We also have some additional points.

We are concerned about the IPR arrangements with HVDC suppliers. We would like to reiterate that HVDC suppliers must conform to the default IPR arrangements as specified in chapter nine of the NIC Governance document in any future contracts involving the MTTE project. Alternatively, they must gain our approval for any required deviations to protect foreground IPR.

We consider the total expenditure of the replica control panel’s hardware, software, delivery, installation and testing to be, at most, not more than ABB’s quote. Funding for the Caithness Moray and the MTTE project, suggests that you are potentially receiving additional funding for this cost item.

Through the subsequent funding direction we expect you to return any savings and unspent funding at the end of the project, in particular on the provision, delivery, installation and testing of the first set of replica control panels, in accordance with chapter seven of the NIC Governance document. We expect you to include any updates and evidence relating to this potential overfunding in your six month reports and in your close down report.

Finally, we consider one of the key benefits of the project will be testing the multi-vendor HVDC capability and enabling competition in the HVDC market. We note that the successful delivery reward criteria (SDRC) listed in the Project Direction only require the installation of the first set of supplier panels. In accordance with the Project Direction, we now impose a further requirement to protect customers’ investment in the MTTE Project fully. This requires you to use reasonable endeavours to install and test additional supplier replica control panels at the MTTE facility by the end of March 2021. This will ensure the full benefits of the project can be realised.

⁴Decision on the Needs Case assessment for the proposed Caithness Moray electricity transmission project under Strategic Wider Works. <https://www.ofgem.gov.uk/ofgem-publications/88879/cmdraftdecisionletter22july14.pdf>

Additional Requirement

Successful delivery reward criterion	Evidence
Use reasonable endeavours to secure the provision and testing of a second set of replica control panels for the MTTE from a second vendor. The panels would be provided by an HVDC project, a transmission Licensee or a second vendor.	Submission of evidence of the use of reasonable endeavours for the provision and testing of the second vendor's replica control panels at the MTTE facility; by the end of March 2021.

Yours faithfully,



Andrew Burgess
Associate Partner, Transmission and Distribution Policy