Transmission Capital Partners

(On behalf of TC Ormonde OFTO Ltd & TC Lincs OFTO Ltd, the NIC funding applicants)
Sixth Floor · 135 Cannon Street · London · EC4N 5BP
T +44 20 3668 6684 · M + 44 7767 298983 · sean.kelly@transmissioninvestment.com

Rhianne Ogilvie
Senior Policy Analyst, Distribution Policy
Smarter Grids & Governance
9 Millbank
London
SW1P 3GE

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Dear Rhianne,

Electricity NIC ISP Clarification

I am writing in response to your email of 14 April, which requested further information on our ISP submission. Our responses are as set out below:

Novelty and Risks Associated with Vessel Conversion

In the proforma, under the innovative section (p7), you state that "The vessels available through such structures had previously not been capable of undertaking repairs on OFTO-type cables". Can you please:

- elaborate on how you reached this conclusion; whether this has been done anywhere else before; and if not, why has this never been done?
- confirm where the key risk sits to prevent the adaption of such a vessel? (i.e. is it that the adaption of a vessel is new, novel and risky process, or is the project seeking to overcome the commercial challenges which are likely prevent such adaption?)

Arrangements that allow a "club" of asset owners to jointly fund the costs of one or more cable repair vessels are currently limited to the telecom-cable sector. None of these arrangements includes vessels that have been originally designed or subsequently modified to allow the repair of power cables. Relative to telecom cables, power cables (in particular the type used by OFTOs) are much larger, much heavier and are damaged if bent excessively. As a result vessels designed to handle telecom cables will (at best) only be able to handle certain types of smaller power cable. Safe handling of OFTO-type cables will require modification or replacement of the equipment used to load and store spare cables, the equipment used to cut the damaged cable and lift it from the seabed, the equipment used to make the repair joints, and the equipment used to lower the repaired cable back to the seabed. In addition to the equipment found on standard telecom repair vessels not being physically capable of handling OFTO-type power cables, improvements to vessel station-keeping may also be required.

There are no vessels contracted to cable repair “asset-owner clubs” (i.e. ACMA and its sister entities worldwide such as PIOCMA in the Indian and Pacific oceans) that could be considered, without modification, for a role repairing OFTO power cables.

There are likely to be several reasons why telecom repair vessels have not previously been modified. A particular issue that we believe worth highlighting is the high cost that would be incurred by the entity instigating the modification, while in contrast the benefit would be spread across all parties joining the club (i.e. a “free rider” problem). In the case of Britain, the fact that benefits will go predominantly to generators and consumers rather than to the OFTOs adds a further level of free rider problem.

If funded, this NIC proposal will result in a vessel that combines the low ongoing costs needed for a telecom repair vessel with the cable handling and station keeping features needed to repair OFTO-type power cables. Such a type of vessel would be new, though the reasons why it has not been done before are commercial rather than technical.

Since the modification of the vessel would not involve (from the perspective of naval architecture) the introduction of any new concepts, it should not be risky providing the work is supervised by a company who have extensive experience in the area. GMSL has the necessary experience. Indeed GMSL have previously modified one of their telecom cable laying vessels in order to allow it to lay power cables. Use of this vessel for power and telecom cable repairs was one of the options considered in the development of this NIC funding request, but the vessel, which has large cable tanks for the laying for intercontinental telecom links and is not optimised for cable repairs, was found to be too expensive to be economic in a cable repair role.

The novel aspect of the project is the combination of an “asset owner club” commercial model with the modification of a vessel that is particularly suited for cable repairs, and which already operates within one such asset owner club (i.e. ACMA). This use of an existing vessel, optimised for repair work, and an existing commercial structure with dozens of members, is the key to the low cost and high benefits of the proposal.

Cost Breakdown

Could you provide a high level indicative breakdown of how the requested funding would be allocated to the different parts of the project?

Just under 80% of the cost relates to vessel modification. The remaining 20% relates to the development of a universal joint and associated training, with the bulk of this relating to the tests required to prove the joint’s acceptability.

Commercial Arrangements on Completion

What would be the nature of the commercial arrangements for the vessel once the project is complete? In answering this, please note that we are keen to understand how customers would receive return on their funding.

The vessel would be accessed through the existing ACMA commercial and contractual arrangements. These would involve payment by each member-OFTO of a relatively small annual fee. This will provide access to a repair vessel much more rapidly and at a much lower cost than is currently possible. The speed arises from the fact that a vessel is on permanent standby awaiting call out, with a guaranteed 24-hour response time. The lower cost arises from the fact that the vessel is optimised for cable repairs, has a relatively certain multi-year revenue stream through ACMA, and is contracted by a very large group of cable owners with pooled purchasing power.

As noted above, the repair vessel will be on 24-hour callout. However there will be some circumstances where the vessel is already undertaking a repair for another member of the ACMA "club". Given the overwhelming preponderance of telecom cables in the ACMA (even if all OFTOs were to join), any work occupying the repair vessel is likely to be repairs to a telecom cable.

The probability of repairs clashing in this way is low since there are three repair vessels available to the ACMA (albeit that only one will be modified for power cables), and since GMSL and other telecom-repair companies have perfected their repair techniques so that telecom cable repairs are undertaken very rapidly. As a result, even if it is necessary to wait for an ongoing repair to be completed, the delays will be modest compared to the delays that are currently the norm for power cable repairs.

As a result of the factors above, it is very unusual for a "queue" of repair works to appear. On the very rare occasions that this happens the usual approach is for the repairs to be undertaken in an order that minimises the time that the repair vessel will spend travelling between successive repair sites.

These arrangements will provide transmission customers and end-consumers with benefits through:

i) Increased delivery of renewable energy from wind farms that no longer suffer prolonged outages: increased power injection should lower wholesale power prices through increased real-time competition, and increased availability of renewable energy will reduce the level of subsidies required to achieve a given target level of renewable power.

ii) Higher transmission availability will allow offshore wind power to be viable at a lower strike price.

iii) Higher transmission availability and lower cable repair costs will allow OFTOs to reduce their tender revenue streams when competing to acquire assets.

iv) In the longer term the availability of rapid cable repairs will allow offshore wind farm connection designs to change to lower-cost arrangements. For instance fewer-but-larger cables can be used if rapid repair is assured, and this allows capital costs to be reduced thanks to the strong economies of scale in cable manufacture and installation. This will further contribute to allowing offshore wind power to be viable at a lower strike price.

Direct Impact Criteria

Are you able to provide more information on how the project meets the direct impact criterion (i) under the value for money section?

NIC projects are required to have a Direct Impact (i.e. their deployment "will cause a measurable change in the operation of the Transmission System in a controllable way"). The Direct Impact of this proposed project would be:

i) Increased availability of OFTO assets within the Transmission System due to more rapid cable repairs. Additionally the risk of particularly extreme outages – where repairs take 6-18 months would be sharply reduced.

ii) Increased availability of other types of offshore cable within the Transmission System (e.g. "bootstraps") due to greater repair vessel availability, leading to reduced constraints on trading energy between parts of GB and increased renewable generation.

iii) Reduced cable repair costs (including reduced need to manufacture replacement spare cables), and a sharply reduced risk of extremely high repair costs – occasions where single repairs can cost £10-20m. Both factors would ultimately lead to lower OFTO tender revenue streams and reduced financial risk for OFTOs.

iv) In the longer term, a shift to offshore wind connections with fewer (but larger) cables, giving lower capital costs.

Rationale for Selection of Ideas

As you know, under the 'Project Partners and external resourcing/funding' criterion, you are required to provide evidence of the processes that have been followed and the rationale for selecting BOTH (i) participants and (ii) ideas for the project. Please either provide this information, or else give an explanation as to why you have not undertaken such processes in developing your proposal.

Our ISP submission describes the processes used to select participants for the project, and in particular the reasons for the selection of GMSL as our supply chain partner.

The process/rationale for selecting the concept is described below. Concepts were based on a re-examination of the three concepts that were submitted for ISP approval in 2013. These concepts in turn originated from a larger pool of concepts that were either brought to our attention by third parties (e.g. suppliers and the wind farms that we serve), were the result of needs identified internally by our asset managers, or were in general circulation in the offshore-cable industry.

More specifically, the origin of the three project ideas put forward in 2013 were as follows:

i) The universal joint concept. This is in wide circulation within the industry, particularly because of the development of a universal joint for submarine fibre optic telecom cables – a development which has been of huge benefit to that sector. Additionally our asset managers have direct experience of onshore universal joints, and have purchased onshore universal joints for TCP OFTOs.

ii) The modified telecom repair vessel concept. This concept was initially raised by ourselves with suppliers, who referred us to ACMA as a body that could provide the commercial framework necessary for the concept. The concept was then developed further with ACMA.

iii) The tyre-mat concept. This was brought to us by E.on, owner of one of the wind farms that we serve. E.on has been involved in the development of tyre mats for the protection of wind turbines from scour and believed that the concept could also be applied to the protection of export cables.

In 2013 all three projects were judged to be sufficiently attractive (in terms of cost-benefit case, technical risk and business case) to merit ISP submission. Subsequently the concepts were re-examined and it was concluded that:

i) The strength of the cost-benefit case was better for the universal joint and repair vessel concepts.

ii) Technical risk was judged to be higher for the tyre-mat concept, and the commercial structure / business case was less clear.

iii) There were found to be opportunities for synergy between the repair vessel concept and the universal joint concept. Without the universal joint, the value of a rapidly-available repair vessel would be degraded if it had to wait for the manufacturer’s jointers. And similarly without a rapidly available repair vessel, the value of rapidly available spares is reduced.

iv) In addition to the above, a supply-chain partner (GMSL) was found who was able to integrate both the repair vessel and universal joint concepts. The involvement of GMSL is critical to our ability to move forward with the project, as their involvement has allowed us to structure the project in a way that sufficiently mitigates the financial risk to the OFTO and its investors. It was the absence of a suitable structure of this type in 2013 that led to our withdrawal from the competition at that time.

v) Further new concepts were sought, but none were judged to be sufficiently attractive.

As a result of this analysis, it was decided to combine the repair vessel and universal joint concepts, and to make an integrated vessel-and-joint concept our 2014 ISP submission.

Yours sincerely

Sean Kelly