

SUSTAINING CONNECTIVITY

Offshore wind is becoming an important part of the energy mix for the UK. With 30 offshore windfarms generating more than 5.1GW of operational capacity and a further 4.5GW under construction, the UK generates more electricity from offshore wind than any other country in the world. Damage to high voltage subsea cables continues to be a major source of losses, both during the construction and the operational stages.

It has been widely reported that 70-80% of the total cost of offshore wind farm insurance claims relate to damage to high voltage subsea cables both array and export. Damage can delay construction projects or cause a reduction in capacity. According to Mike Ritson, who has extensive industry experience and is currently working with CWind “most claims I have been involved with occurred during the installation phase. The danger is that sometimes there is no physical outward appearance of damage when the cable quickly goes beyond the minimum bend radius. Many don’t fail immediately, but operate for two, three or even five years before failures manifest themselves.

Dominik Adamus, Commercial Director at Transmission Capital Partners agrees “I think some of the findings we have seen recently are associated with manufacturing, but there is the theory that over bending and not handling the cable properly during installation may have contributed towards the faults that have occurred during operations.”

Mike suggests that “if you start with a manufacturing fault and then you install the cable poorly you can exacerbate the problem, with the manufacturing fault alone not being responsible for the cable failure.”

In years gone by, the subsea cables were on the critical path and any loss or damage had the potential to delay the start-up of the windfarm. Nowadays, windfarms are more complex and transmission towers and platforms tend to be more critical. With subsea cables being bespoke for each project and their cost far outweighed by installation, possibly by as much as three or four to one, and taking account of potential delay in start up, firms are now taking risk mitigation measures.

Mike explains “developers tend to purchase additional spares and extra cable to cater for potential loss. This enables them to react quickly if a cable fails, being able to mobilise a vessel quickly to repair the cable is the key to

minimising down time of the turbines and the exorbitant loss of earnings that directly impacts the developer.”

With shortages in the availability of vessels and skilled labour, many companies are now entering into framework agreements, similar to the Atlantic Cable Maintenance Agreement (ACMA). This maintenance model has been used in the telecoms industry for decades, vessels are stood with repair spreads on them ready to repair faults. Mike explains “essentially, it’s an insurance club that pays for these vessels to standby and all the member companies contribute to the running costs. These vessels are able to leave port within 24 hours of a fault being reported, which gives peace of mind to infrastructure owners. The offshore renewable industry is starting to look at this model as a potential solution to address the length of time currently taken to undertake power cable repairs within the sector, the rapid response mechanism of these consortia would have both a positive and significant impact on the developers.

This is all a sign that the sector is becoming more mature in its thinking and this is something Dominik would like to see more of. “I would prefer to see firms invest a little more at the beginning by getting a good installer, good cable etc. and just thinking more about the whole lifecycle cost, including the potential when it goes wrong and causes loss of power generation, when costs can quickly escalate into hundreds of thousands or even into the millions of pounds.

When insurance claims do arise during installation, quite often they can involve the Original Equipment Manufacturer, who has typically provided warranties. According to James Pummell, Loss Adjuster, Integra Technical Services “once manufacturers are informed of a possible issue during installation, they may withdraw the warranty from that part of the cable. Manufacturers will likely reinstate warranties once repairs have been completed, but clearly offshore repairs are costly and time consuming. If installation were to continue without repairs, and warranties are not in place, this can affect the Projects ability to divest the asset on completion.”

Whilst most subsea cable losses relate to installation, there are incidents during the operational phase. In Dominik’s experience these “tend not to be human error, but it can often be difficult to determine the cause.”

James agrees “It is understood that the fibre optic cores in high voltage subsea cables are of particular interest in recent losses, in some cases they are believed to have been the cause of damage to power cores, but the mechanisms of these failures are not widely understood as you can end up with a short circuit between the cores which destroys that section of cable, and it is then impossible to dissect and do a root cause analysis.”

Key Impacts from cabling problems

- Significant remedial work requiring replacement cables, storage sites, additional vessel costs and increased project management costs;
- Delay to start-up of the wind farm;
- Lost wind farm generation revenue;
- The transfer value determined by Ofgem being less than the actual costs of developing the transmission infrastructure (paid for by the developer under the Generator Build model);
- Delay in transferring assets to the offshore transmission owner
- Regular ongoing remedial work.