Best practice guideline for the complete condition monitoring (CM) of offshore wind farm (OWF) cable networks

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The development of electrical condition monitoring (CM) technology in the offshore wind farm (OWF) industry has been limited to date. There is presently limited availability of systems in the market that can effectively perform the monitoring and correlation of several electrical condition parameters to enhance the insulation condition assessment of the export cables and inter-array cable network.

In addition consideration must be given to performing diagnostic testing at all stages in the life time of cable circuits, starting with the commissioning and then during its service life as part of condition-based maintenance programs.

Firstly the paper focuses on an up-to-date overview of the best strategy to perform commissioning/acceptance testing on newly installed MV/HV cables and assets then 'the best practice guideline' to the condition monitoring of off-shore windfarm cable networks is presented.

Measurements of online partial discharge (OLPD), power quality (PQ) parameters, sheath current (SC) and data from time domain reflectometry (TDR) are combined to provide a 'holistic' condition monitoring technique to on-line asses the condition of export cables and inter-array network as well as the switchgear and transformers present within the network. Several case studies from field measurements on a range of networks covering circuits from 33 to 132 kV are presented.

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