

Ampacity Simulation of a High Voltage Cable Used in Offshore Wind Farms

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Abstract

The ampacity of a cable depends on the cross section of its conductor. When selecting a cable design for a specific application it is of interest to choose the lowest possible conductor cross section in order to reduce material costs. Therefore an exact calculation of the ampacity is necessary; it is usually limited by the thermal resistance of the insulating cable materials. Commonly the ampacity is determined using semi-empirical methods to evaluate the maximum temperatures. These methods include safety margins that may result in low ampacity values. In this study COMSOL Multiphysics is used to determine temperature conditions in a high voltage cable connecting off shore wind platforms. It is shown that the conventional analytical methods don't apply to the given conditions and the simulation is able to demonstrate alternative methods to determine the ampacity.