



Power Delivery to Subsea Cabled Observatories

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Abstract

Subsea cabled observatories are Direct Current (DC) powered scientific infrastructures connected to the shore via long telecommunications cables. Long cable runs are susceptible to voltage transients during startup, power down and load changes caused by the reactive components of the cable. This problem affects both the medium voltage supply (up to 10 kVDC) to the nodes and intermediate voltages (around 375 VDC) distributed from the node via long cables to secondary nodes. This paper describes the use of DC power via long cables and the potential for transients created in the cable. Systems implemented to understand, test and mitigate these effects are then discussed. Transistor based over-current control and over-voltage protection are shown to offer significant and predictable protection to systems over traditional passive components. A case study is provided on the intermediate voltage used to supply power to the NEPTUNE Junction Boxes from the NEPTUNE Node.

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