

## Development of submarine MV-AC power cable with aluminum conductor

Sven **MUELLER-SCHUETZE** (1), Heiner **OTTERSBERG** (1), Carsten **SUHR** (1), Ingo **KRUSCHE** (1), Daniel **ISUS FEU** (2)

- 1 Norddeutsche Seekabelwerke GmbH/General Cable, Nordenham (Germany), [sven.mueller-schuetze@nsw.com](mailto:sven.mueller-schuetze@nsw.com), [heiner.ottersberg@nsw.com](mailto:heiner.ottersberg@nsw.com), [carsten.suhr@nsw.com](mailto:carsten.suhr@nsw.com), [ingo.krusche@nsw.com](mailto:ingo.krusche@nsw.com)
- 2 General Cable, Manlleu, Barcelona (Spain), [disus@generalcables.es](mailto:disus@generalcables.es)

A demand exists, mainly driven by the renewable energy sector, to reduce the construction cost of offshore power interconnections between offshore platforms, islands and shore. This demand needs to be addressed through the reduction of both production and material costs of submarine power cables. In this context, both the conductor material selection and the submarine power cable design play crucial roles.

Aluminum as conductor material possesses lower conductivity compared to copper resulting in the need to select larger conductor cross sections. Despite the larger conductor cross section, cost reduction is achieved due to the much lower material price of Aluminum. In addition power core and submarine power cable designs were reviewed including the selection of materials and manufacturing techniques. During the development project the materials selection and cable design adjustments were reviewed by theoretical studies and tests to validate the application of the design.

The submarine power cable design is intended for installation in water depths up to 300 m and the application of additional cable protection methods such as rock dumping for on-bottom stabilization.

A type test qualification has been performed on 3x 800 mm<sup>2</sup> 19/33 (36)kV XLPE submarine power cable with Aluminum conductor incorporated with one 48-core fibre optic cable. The qualification program was performed under consideration of the CIGRE Electra 171, CIGRE Electra 189, IEC 60502-2 and CENELEC HD620-10C. The cable system passed successfully all mechanical, electrical and non-electrical tests.

The authors will present the main characteristics of the cable in test, and details the results obtained.