## The Role of Analytical Methods in Electrical Loss Calculations for High-Voltage Armored Three-Core Power Cables

Wednesday 18 June 2025 11:15 (15 minutes)

For large high-voltage power cables, such as the export cables connecting offshore windfarms to shore, a key design challenge is calculating the cable's current-carrying capacity: the maximum current it can carry without exceeding a specified temperature limit. For complex cable designs, such as three-core cables with metallic screens and steel-wire armor, commercial Finite Element Method (FEM) software has become a widely used tool for calculating electrical losses. While FEM through commercial software is powerful and general, it also comes with some drawbacks: it's time-consuming, expensive, and requires specialized user expertise. Is it possible that "old-school" analytical methods still have a role to play?

This presentation will cover the design and a typical use case of modern armored three-core power cables, the physical principles behind losses occurring in such cables, and briefly touch on a specific method for calculating armor losses.

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