



Electromagnetic Transients in Power Cables (Power Systems)

By Filipe Faria da Silva, Claus Leth Bak

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From the more basic concepts to the most advanced ones where long and laborious simulation models are required, *Electromagnetic Transients in Power Cables* provides a thorough insight into the study of electromagnetic transients and underground power cables. Explanations and demonstrations of different electromagnetic transient phenomena are provided, from simple lumped-parameter circuits to complex cable-based high voltage networks, as well as instructions on how to model the cables.

Supported throughout by illustrations, circuit diagrams and simulation results, each chapter contains exercises, solutions and examples in order to develop a practical understanding of the topics. Harmonic analysis of cable-based networks and instructions on how to accurately model a cable-based network are also covered, including several “tricks” and workarounds to help less experienced engineers perform simulations and analyses more efficiently.

Electromagnetic Transients in Power Cables is an invaluable resource for students and engineers new to the field, but also as a point of reference for more experienced industry professionals.

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Editorial Review

From the Back Cover

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About the Author

Filipe Faria da Silva was born in Portugal in 1985. He received his MSc in Electrical and Computers Engineer in 2008 from Instituto Superior Técnico-Portugal and his PhD in Electrical Engineering in 2011 from Aalborg University, Denmark. He is currently Assistant Professor at the Department of Energy Technology, Aalborg University in Denmark, where he lectures in the area of power systems, from bachelor to PhD level, and supervises projects in the area of power cables and DC transmission.

In 2008, he was with Labelec-EDP working with thermal analysis of underground cables. From 2008 to 2011, he was with the Danish TSO (Energinet.dk) as Industrial PhD student working with electromagnetic transients in HVAC cables. Filipe Faria da Silva is a member of IEEE and CIGRÉ. His main research interests are electromagnetic transients, high voltage cables, power systems modelling and HVDC transmission.

Claus Leth Bak has a long experience in power systems both in industry and academia, which extends for almost two decades. He is a Professor and Head of the Energy Technology PhD programme at the Department of Energy Technology, Aalborg University. He has supervised a total of 15 PhD students of which four PhD projects are in the field of high voltage power cables together with a number of related Master's Thesis projects. The supervision of these projects in this topic was mainly done in the last eight years since the Danish Government prohibited new overhead lines and decided to underground a large portion of the transmission network. All PhD projects and Master's projects were made in a close collaboration with the industry and TSO. He is a member of CIGRÉ working group C4.502 (Power system technical performance issues related to the application of long HVAC cables) and the CIGRÉ C4 study committee as well as member of the CIGRÉ Danish National Committee. He is an IEEE Senior member. Claus Leth Bak's main research interests include power system transients and simulations, relay protection,

high voltage engineering and HVDC-VSC transmission.

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