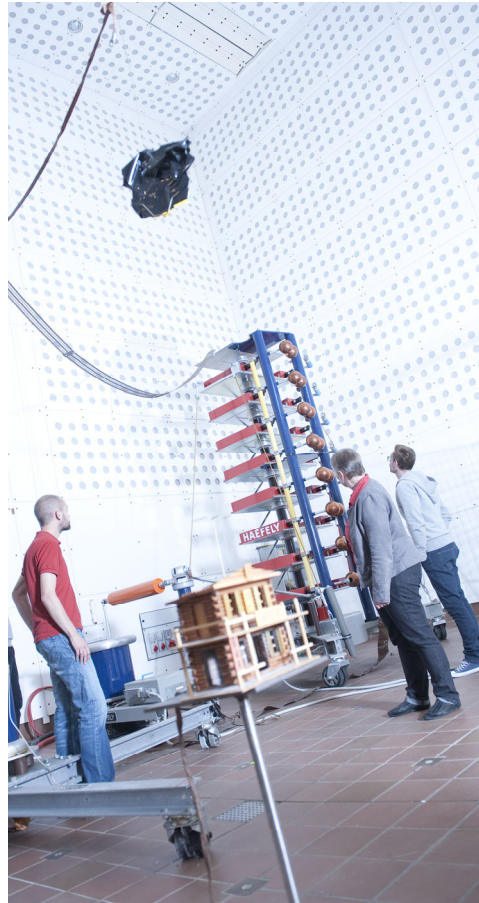


Collaboration partners

- Energinet
- Ørsted
- Banedamark
- Bystrup Architecture Design Engineering
- DEIF

Laboratory facilities

- High-voltage laboratory: 800 kV impulse generator; PD detectors; 200kV cascaded transformers
- Medium-voltage laboratory: up to 20kV-2MVA; 200kW cooling capacity
- Various equipment for field measurements: Omicron CMC 356 and 256-6; Omicron CPC 100 (2000A), 5kV surge generator; Rogwoski and HV probes



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DEPARTMENT OF ENERGY TECHNOLOGY
AALBORG UNIVERSITY

Research programme Modern Power Transmission Systems



DEPARTMENT OF ENERGY TECHNOLOGY
AALBORG UNIVERSITY

Modern Power Transmission Systems

The research programme handles all topics related to transmission systems, but focus is put upon topics highly related to the development and challenges of modern transmission systems. More specifically, HVAC transmission cable technology in all its aspects, HVDC multiterminal transmission networks, power quality issues with focus on harmonics, offshore-to-onshore network connection, modern relay protection, network restoration and high voltage issues.

Our main research challenges are:

- To model and simulate dynamic and transient behaviors of transmission systems, especially when such are based on HVAC cables
- To understand the interaction of PE-generation with the transmission grid for steady-state and transient performance, as well as regarding harmonic emission
- To predict the harmonic content and respective propagation in the transmission grid together with optimising their mitigation
- To contribute to the development of large offshore transmission networks, with focus on multiterminal HVDC-VSC
- To perform accurate measurements in transmission systems in order to develop dynamic and transient simulation models with an ever increasing accuracy
- To locate faulted conditions in HVAC and HVDC cables with a high accuracy
- To understand and model transmission networks with high penetration of renewable energies for stability studies
- To improve and develop insulation for new HV designs and technologies



Focus areas

- Power Cables
- Power quality and system stability
- Multiterminal HVDC transmission
- High voltage
- System protection for challenging configurations



Examples of research projects

- PoPyFu: Power Pylons of the Future
- DANPAC: HVAC transmission cable networks
- HARMONY: Harmonic identification, mitigation and control in power electronics based power systems
- COBRACable: Multi terminal HVDC-VSC link



Mission

To conduct research at the highest level, together with industry partners, in order to allow a technically sound and long-term reliable transition of today's power transmission system into a modern transmission system capable of handling existing and future demands as: disperse and power electronics based generation, long HVAC cables, multiterminal HVDC links or lower inertia. This is a huge and expensive task of a very high importance for modern society with impact in economy, quality of life and national security.