

EMC in (Electric) Ship Power Systems

SUMMARY

This project will involve determining an optimum solution to reduce the impact of CM current on sensitive devices present onboard a ship.

THE ROLE

The main producers of Common Mode (CM) voltage are the 2-level power electronic converters present onboard a ship, which can function as either Active Front Ends or Inverter Units. The CM voltages produced by these devices induce CM current that can find their own path through the ships electrical systems back to their source. This path may include sensitive devices which are critical for proper functioning of the vessel. Therefore, finding the path of CM current and re-directing it through a preferred path or suppressing it through CM chokes are some ways to protect sensitive devices.

KEY ACCOUNTABILITIES

As a graduate at Electrical and Automation department of Damen RD&I you will face multiple aspects of applying advanced measurement and simulation methods in various phases of electrical system design of a ship. To carry out these measurements and simulations various tools and equipment are available to achieve your research goal. You will be responsible from day one for the planning and execution of your research project. You are expected to deliver a detailed in-depth analysis of your research problem and meanwhile be able to communicate the results and conclusions to other departments.

COURSES

- 1A: Power Electronic converters (recommended)
- 1B: Electric Machines and Drives (recommended)
- 2A: Electromagnetic Compatibility (EMC) (recommended)

SKILLS & EXPERIENCE

- Electrical engineering student pursuing a Master's degree.
- Proficient in simulation skills of MATLAB and Simulink.
- A bit of practical experience with measurement equipment (like oscilloscope and impedance analyzer) and electrical systems.
- Good command of English, especially in writing.

WHAT DOES DAMEN OFFER

A monthly allowance will be paid for the duration of the assignment. Flexible working hours can be discussed and proper mentoring at academic level will be available throughout the internship.

[1] DAMEN. (25-09-2023) *Damen to introduce fully electric Service Operations Vessel for offshore wind farm sector* [Online]. Available: <https://www.damen.com/insights-center/articles/damen-to-introduce-fully-electric-sov-for-offshore-wind-farm-sector>



Figure 1: Example of a fully electric ship from DAMEN [1].

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