Søren Find Madsen

M.Sc., PhD Electrical Engineering

Søren Find Madsen
Lightning Protection Specialist
M.Sc. PhD

PROFILE

Energetic electrical engineer, specialized in numerical multiphysics modelling and verification testing, and with a huge network in standardization and global research.

CONTACT

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PERSONAL

Married since 2004
Three kids (2005, 2008, 2011)

LANGUAGE

Danish: Mother tongue
English: Proficient user

WORK EXPERIENCE

Upvious ApS – Founder and owner

2024-11 to now

Upvious is a consulting engineering firm specialized in electrical engineering and lightning protection. The tasks cover understanding complex electrotechnical challenges, modelling electrophysical phenomena in power systems and lightning interactions with building and structures.

Projects are solved singlehanded, or in collaboration with a few selected partners within the industry.

Polytech A/S – Head of R&D Electrical & Mechanical, Lightning Specialist

2018-09 to 2024-11

My role in Polytech was to manage a team of 25 engineers responsible for all mechanical and electrical designs within Polytech. Combining conceptual and detailed design studies involving numerical modelling and testing, allowed us to adapt our LPS design to various customer requirements considering also structural properties, CFD aeroelastic simulations, structural health monitoring, etc. Alongside with our production focused engineering, we solved numerous consultancy assignments within multiphysics modelling, incl. risk exposure assessments, protection of gas and other mission critical installations exposed to lightning or power system failures, HVDC subsea electrode designs and associated stray current mitigation.

Global Lightning Protection Services A/S – CTO, Co-founder, Co-owner

2012-06 to 2018-09

Global Lightning Protection Services A/S was a result of merging Electricon A/S, Testinglab Denmark ApS and Highvoltage.dk ApS into one strong entity. Global Lightning was specialized in lightning protection of wind turbines and other mission critical applications, during the design phase and the final experimental verification. Our core engineering services were expanded beyond the local customers to now serve a global market with engineering consultancy and LPS services and products.
In GLPS my role included overall technical responsibility of our solutions (LPS and LMS) and services (Multipysics engineering, HVDC design work, risk assessment based on local topography and lightning environments), management of large public funded R&D projects (ELITE, LIBI, SPARCARB) as well as daily management and interactions with the board of directors.

TestingLab Denmark ApS – CTO, Co-founder, Co-owner

2008-01 to 2012-06

TestingLab Denmark is a common entrance into the world of lightning protection of facilities and systems, electrical engineering, and testing of associated technologies.
TestingLab Denmark was a company that owned and operated one of the largest commercially driven test facilities for lightning verification tests, utilizing impulse voltages up to 2.5MV, DC voltages up to 600kV, impulse currents up to 250kA and short circuit currents of 15kA. Our test facility measured 73m x 32m x 14m (LxWxH) and was used for testing full nacelles and blades.
My role in TestingLab Denmark was to design and construct our test equipment, participate in standardization and global wind turbine test fora, and commercial interaction with customers.

Highvoltage.dk ApS – Founder and owner

2005-09 to 2012-06

Highvoltage.dk is a consulting engineering firm having key competences within high voltage engineering and lightning protection, strong in theory as well as in practical laboratory exercises. The core of the company was a thorough understanding of electrical engineering physics, and the ability of defining pragmatic engineering solutions using modelling tools and experimental work. The tasks executed ranged from modelling lightning physics, temperature distribution in structures subject to lightning current, power system behaviour and failure modes, HVDC subsea electrode detailed design, mitigation measures for stray current in industrial facilities, etc.

Mogens Balslev A/S – Electrical Engineer

2001-09 to 2003-03

Mogens Balslev A/S was a specialized electrical engineering consultant, working globally for industrial customers. As part of a team within corrosion studies, I developed 3D numerical codes for analyzing stray current as consequence of monopole HVDC links, as well as the needed mitigation measures.

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EDUCATION

Technical University of Denmark – PhD degree

2003-03 to 2006-03

The title of my PhD dissertation was 'Interaction between electrical discharges and materials for wind turbine blades – particularly related to lightning protection', and research project initiated by Energinet-E2 (now Ørsted) due to extensive problems with field performance of wind turbines. The task was to investigate the materials used and suggest means of improving material properties as well as defining protection strategies for increasing turbine uptime.

The results of the research have been published in conference and journal papers, as well as included in the international standard IEC 61400-24 series.

Technical University of Denmark – M.Sc. Electrical Engineering

1996-09 to 2001-08

Starting out on the topic of Energy Engineering, I took courses available in Thermodynamics, Physics, Energy conversion, sustainable energy, etc. At the later semesters, I focused on courses within electrical engineering and particularly high voltage engineering.
My Master's Thesis considered combined DC and impulse testing of HVDC cables.

ADDITIONAL INFORMATION

Censor at Technical University of Denmark

2022 to now

External examiner at the Technical University of Denmark (DTU), in courses within high voltage engineering, power engineering and lightning protection, as well as BSc and MSc. Final projects.

IDA Elektropris (yearly award from the Danish Society of Engineers)

2016

The Danish Society of Engineers reward one person annually for outstanding contribution within the field of Electrical Engineering. In 2016 I received the award due to my work within lightning protection of wind turbines.

IEC 61400-24: Wind Turbines – Part 24: Lightning Protection

2005 to now

Since the kickoff of the first international standard on lightning protection of wind turbines, I have been actively involved in writing the requirements for blades and the guidelines on verification testing. Since 2014 I have been secretary for the MT24 responsible for the Ed2 version published in 2019, and now the work towards Ed3.

International Conference on Lightning Protection'2006 – Diploma for Young Scientist

2006-09

At the international conference on Lightning Protection in 2006, I received the Diploma for Young Scientists for the paper: "New test method for evaluating the lightning protection system on wind turbine blades"

HOBBIES

Leadership within the Danish Scouts

Scouting has been a natural part of my life since 1984, and latest in 2014 I founded a scouting group in my neighbourhood, now attended by 140 kids and 20 adult leaders. My role is group leader and leading 25 toddlers aged 3-6 years. In 2022 I was part of the leadership team for the Danish Scout Jamboree "Spejdernes Lejr", where I in 2026 have taken the role as leader for one of the subcamps of 8000 scouts and 550 volunteer leaders.

Exercise

To stay fit for my tasks, I enjoy running and working out, with several half marathons and two full marathons completed.

SKILLS

Technical and Innovation leadership
Electrical power system engineering, AC, HVDC, EM fields
Lightning protection of wind turbine blades, and wind turbines in general
Lightning testing, Lightning modelling
International research collaboration
Standardisation and pre-standardisation, national and international