



European Safety and
Reliability Conference
14–19 June 2026
Braga, Portugal

SS-10: Development and Application of Methods for Enhancing the Reliability of Power Electronics Devices

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Description

Electronic Components and Systems (ECSs) are the foundational building blocks of modern technology, from the individual semiconductor devices that form critical sub-systems like converters and motor drives, to the complex final systems they enable, such as electric vehicles, renewable energy grids, and medical devices. It is, therefore, fundamental to enhance and ensure reliability of ECS by using various emerging techniques.

In this context, this special session aims at collecting contributions discussing theoretical and technological advancements for enhancing the reliability of ECS.

The motivation of proposing this special session emerges from the research and development activities performed within the European Project “Safer and More Reliable WBG/UWBG-Based MVDC Power Converters” (SAFEPOWER, <https://www.safepowerproject.eu/>): the project outcomes will be shared.

The special session accepts contributions from all interested colleagues (not necessarily only those involved in the SAFEPOWER project).

Topics of Interest

- Fault detection, diagnostics and prognostics of ECS
- Prognostics and Health Management (PHM) of ECS
- Maintenance of ECS
- Physics-of-Failure (PoF) and data-driven models for the reliability assessment of ECS
- Quality and aging monitoring of electronic devices
- Digital twins of converters and motor drives
- Advanced methods for maintenance and control of converters