

## Combined Safety and Cybersecurity Risk Assessment for Intelligent Distributed Grids

**Authors :** Anders Thorsén, Behrooz Sangchoolie, Peter Folkesson, Ted Strandberg

**Abstract :** As more parts of the power grid become connected to the internet, the risk of cyberattacks increases. To identify the cybersecurity threats and subsequently reduce vulnerabilities, the common practice is to carry out a cybersecurity risk assessment. For safety classified systems and products, there is also a need for safety risk assessments in addition to the cybersecurity risk assessment in order to identify and reduce safety risks. These two risk assessments are usually done separately, but since cybersecurity and functional safety are often related, a more comprehensive method covering both aspects is needed. Some work addressing this has been done for specific domains like the automotive domain, but more general methods suitable for, e.g., intelligent distributed grids, are still missing. One such method from the automotive domain is the Security-Aware Hazard Analysis and Risk Assessment (SAHARA) method that combines safety and cybersecurity risk assessments. This paper presents an approach where the SAHARA method has been modified in order to be more suitable for larger distributed systems. The adapted SAHARA method has a more general risk assessment approach than the original SAHARA. The proposed method has been successfully applied on two use cases of an intelligent distributed grid.

**Keywords :** intelligent distribution grids, threat analysis, risk assessment, safety, cybersecurity

**Conference Title :** ICSG 2022 : International Conference on Smart Grids

**Conference Location :** Dubai, United Arab Emirates

**Conference Dates :** January 28-29, 2022