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SS-30: Risk and Reliability Analysis in Hydrogen Systems

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Description

Global energy consumption has increased remarkably over the last decade due to population growth and improvements in living standards. However, most of the total energy is produced by fossil fuels that emit greenhouse gases, and the demand for a decarbonization process is increasing in the energy and industrial sectors. In this context, hydrogen has drawn significant interest in energy sustainability. Hydrogen has the highest energy content by weight, and when used in fuel cells, it produces only water as a byproduct. Electrolytic hydrogen production, when paired with a renewable or clean energy source, can produce clean hydrogen that can be used for a variety of purposes, including transportation, industrial manufacturing, and energy storage. As hydrogen can be transported and stored in high-pressure pipelines, tanks, and cryogenic vessels, safety requirements and studies are crucial. Therefore, this special session is dedicated to new developments for risk and reliability analysis in hydrogen systems.

Topics of Interest

- Prognostic and health management for storage and transportation
- Quantitative Risk Assessment of hydrogen systems
- Reliability-based design optimization of hydrogen infrastructures
- Machine learning applied to hydrogen systems
- Optimization in fuel conversion/production
- Case studies and applications on hydrogen systems
- Lessons learned and human factors in industrial applications