**Enabling the energy future through quantitative risk assessment (QRA): insights for hydrogen fueling stations, electrolyzers, nuclear power plants**

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Safety and reliability issues can impede development and adoption of new technologies, and hydrogen systems are no exception. The widely anticipated adoption of hydrogen technologies requires that the risks associated with those technologies be rigorously investigated and mitigated early in the lifecycle. Likewise, the anticipated expansion of nuclear power technologies merits similar considerations. Quantitative risk assessment (QRA) enables proactively addressing potential failures before they happen – and learning from failures and near misses when they happen. Assessing and addressing risk will enable minimizing failures, downtime, maintenance costs, property damage, injuries, loss of public trust, and costly litigation. This talk discusses how QRAs advances have and will enable advances in critical energy technologies, ranging from: hydrogen fueling stations to electrolyzers to advanced nuclear reactors. The emphasis is on 1) sharing early insights that will enable safety and reliability of energy technologies, 2) demonstrating the value of reliability engineering and risk analysis as key aspects of nuclear and hydrogen safety and 3) inspiring the research community to advance the use of safety and reliability engineering to enable collective progress toward the energy future.