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Advances in Stress Rupture Modeling: A Case Study for Predicting COPV Reliability

Tuesday, 17 September 2024 12:00 (30 minutes)

In this presentation, we present a case study that results from a multi-stage project supported by NASA's Engineering Safety Center (NESC) where the objective was to assess the safety of composite overwrapped pressure vessels (COPVs). The analytical team was tasked with devising a test plan to model stress rupture failure risk in carbon fiber strands that encase the COPVs with the goal of understanding the reliability of the strands at use conditions for the expected mission life. While analyzing the data, we found that the proper analysis of the data contradicts accepted theories about the stress rupture phenomena. During this presentation, we'll offer statistical insights and elaborate on our successful integration of statistical reasoning into the engineering process, prioritizing evidence-based decision-making over intuition.

Type of presentation

Talk

Classification

Both methodology and application

Keywords

statistical engineering, reliability, NASA

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