PHM in Transportation: comparison between air and ground transportation. Possible synergies ?

Abstract

Availability, safety, and cost-efficiency are critical concerns across all transportation modes—whether ground-based or air-based—with maintenance representing a significant portion of life-cycle costs. This makes condition-based maintenance (CBM) and prognostics and health management (PHM) increasingly important. The rise of machine learning, especially deep learning, has substantially accelerated PHM development. However, challenges such as data availability, quality, scalability, and regulatory complexity persist. In particular, PHM for safety-critical components and assets often encounters stronger resistance, partly due to lack of adapted regulations.   Despite shared goals, the adoption and maturity of PHM vary significantly across transportation sectors due to differing technical requirements, business models, and regulatory environments. Aerospace has historically led the way, while railways and automotive are still navigating key barriers. This round-table discussion aims to explore potential synergies across transportation domains to advance PHM practices. Topics will include cross-industry enablers and obstacles, data standardization and sharing, regulatory impacts, business models, talent and research funding gaps, and the potential need for new standards. The goal is to identify actionable paths toward cross-sector collaboration that can accelerate innovation and broaden the impact of PHM across the transportation ecosystem.