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Does the Maturity of Structural Health Monitoring Technology Match User Readiness?

Издательство DEStech Publications, Lancaster, 2011 год

14 стр; формат: 23,5 x 16 см
ISBN: 978-1-60595-053-2

Код: 10245

The use of in-situ sensors for real-time health monitoring of aircraft structures can be a viable option to overcome inspection impediments stemming from accessibility limitations, complex geometries, and the location and depth of hidden damage. Reliable structural health monitoring (SHM) systems can automatically process data, assess structural condition, and signal the need for human intervention. There is a significant need for an overarching plan that will guide near-term and long-term activities and will uniformly and comprehensively support the evolution and adoption of SHM practices. Such a plan must contain input from aircraft manufacturers, regulators, operators, and research organizations so that the full spectrum of issues, ranging from design to deployment, performance and certification is appropriately considered. An important element in developing the FAA SHM R&D Roadmap is a clear understanding of the current status of SHM technology and the pending regulatory issues facing the aviation industry to safely adopt SHM solutions. Towards that end, a comprehensive survey was implemented with the aviation industry to determine the technology maturation level of SHM, identify integration issues, and prioritize research and development needs associated with implementing SHM on aircraft. Specific emphasis was placed on structural and maintenance characteristics that may impact the operational performance of an inspection process or health monitoring system. In addition, an SHM Technology Readiness Database (SHM TRaD) and an SHM Sensor Database were developed to assess the present and future prospects of SHM technology. This paper will present the results from these efforts and describe how the FAA is using this information to support the safe adoption of SHM practices.

Ключевые слова:

Содержание.

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