Aircraft Maintenance: the Structural Health Monitoring influence on costs and practices

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Abstract: The Structural Health Monitoring (SHM) represents an evolution of the traditional way to design and maintain mechanical structures. SHM systems allow to continuously (or discretely) monitor the structural integrity of an asset, not waiting for the planned check. This result implies an important reduction of inspection time and guarantees an improvement of service life cost of the structural components, but how and how much this cost can be influenced is still an open issue. This research addresses the identification of previous studies that dealt with this topic. A systematic literature review is carried out with the aim of investigating the current SHM state-of-the art in the aircraft industry in order to point out the main advantages deriving from the application of these technologies and the existing gaps and limitations. Three database (Scopus, Web of science and Google Scholar) have been used for selecting peer-reviewed papers that address with evidence the changes in maintenance practices resulting from the use of SHM. The analysis proves the differences between the traditional programmed maintenance and the innovative predictive approach based on SHM information in term of interval inspection policy and costs. Moreover, the technical limits that do not allow to totally exploit the potential strength of SHM have been outlined.