

46ESS-21: Life Usage Monitoring Systems

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Life usage monitoring systems can be implemented and installed on gas turbine engines to provide crucial data about the damage on the components and a real-time analysis of the life consumption. This is significantly important for civil and military aero-engines, which operate in a wide range of different and sometimes deleterious ambient conditions around the world and have a great sensitivity to degradation. Life prediction models at the design stage does not take into account many of the factors that affect and actually cut the real life of the machine, and hence the predicted life usage can diverge from the actual one. The aim of such a monitoring system is to prevent a sudden failure and to have a constant updated life expectation, by overseeing the life of the components and the cumulative damage on them, in order to plan an accurate and efficient overhaul, which can optimize the costs of the maintenance by reducing the down-time and potentially improve the availability of the engine. The diagnostic is based on an evaluation of all those operating parameters affected by detrimental factors which are responsible of the degradation. In this paper, some examples of these monitoring systems will be analysed.