

Real-Time Aircraft Engine-Life Monitoring

For real-time health monitoring of aircraft engine components and systems

This project developed an inservice life-monitoring system capable of predicting the remaining component and system life of aircraft engines. The embedded system provides real-time, inflight monitoring of the engine's thrust, exhaust gas temperature, efficiency, and the speed and time of operation. Based upon this data, the life-estimation algorithm calculates the remaining life of the engine components and uses this data to predict the remaining life of the engine. The calculations are based on the statistical life distribution of the engine components and their relationship to load, speed, temperature, and time.

Applications

NASA

- ▶ Aircraft engine performance

Commercial

- ▶ Aviation and aerospace:
 - Inflight monitoring system analyzes remaining service life of aircraft engine



NASTEC photo

Phase II Objectives

- ▶ Acquire profiles of aircraft system engines
- ▶ Develop a complete embedded hardware/software system architecture
- ▶ Verify the system design in simulation
- ▶ Integrate the life monitor into a commercial or military aircraft

Benefits

- ▶ More accurately predicts remaining component and system life of aircraft engines
- ▶ Improves aviation safety, reliability, and maintenance
- ▶ Reduces life-cycle costs and maintenance costs
- ▶ Facilitates cost-effective design and manufacturing of new production engines

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