



## **NASA SBIR 2008 Phase I Solicitation**

### **A1.08 Engine Lifing and Prognosis for In-Flight Emergencies**

**Lead Center: GRC**

The object of this research topic is to develop innovative methodologies to determine probability of an engine system failure under emergency flight conditions that demand a boost in the engine performance, thus potentially sacrificing the engine, to increase the engine control effectiveness for a safe take-off or landing.

Aircraft engine design and life are based on a theoretical operation flight profile that in practice is not seen by most engines in service. The ability to predict remaining engine life with a defined reliability in real time is a condition precedent to emergency operation risk assessment. It is expected that this research will result in a demonstration of an integrated life monitoring and prognosis methodology that will utilize existing and under development probabilistic codes for engine life usage and for risk assessment for future operations that may require enhanced performance.

The expected outcome of the research will be a demonstration of an integrated engine life module for:

- Engine life prediction, including a reliability model for off-nominal conditions.
- Risk assessment and trade-off tool for emergency operation.

NASA resources available for the research will be an engine component database for turbine disks and blades, and probabilistic computer codes for life prediction and reliability.