

DEVELOPMENT OF DATA PREDICTION MODEL FOR THE LUBRICATION SYSTEM IN A DEVELOPMENTAL GAS TURBINE ENGINE

Usha Srinivasan, N. Muthuveerappan
Scientist
Gas Turbine Research Establishment (GTRE)
Defence Research and Development
Organisation
Min of Defence, CV Raman Nagar
Bangalore-560 093, India
Email : usha8762@gmail.com

K.R. Sudhindra
Associate Professor
Department of Electronics and Communication
Engineering
BMS College of Engineering
Bull Temple Road, Basavanagudi
Bangalore-560 019, India
Email : krsudhindra.ece@bmsec.ac.in

Abstract

A developmental aero gas turbine engine, embedded with rotating components needs to be supported with a well-designed lubrication system to address its friction, heating and cleansing requirements. To ensure and sustain the intended lube systems performance, apt and timely maintenance by continual monitoring of its performance parameters are desirable. Instrumenting the lube system and developing models to predict the feasible performance parameters are the approaches which go hand-in-hand to handle the transition from lavish ground trial instrumentation to the scanty flight trial instrumentation. This paper depicts a data prediction model which has been developed, validated and deployed for the temperature measurement in the lubrication system using the cooler temperature of an aero gas turbine engine under development. The data thus predicted as a virtual sensor, not only supplements the thermocouple measurement during the ground trials, but also ensures its confident usage in the absence of thermocouple measurements during flight trials.

Keywords: Data Fusion, Lubrication System, Kalman Filter, Data Prediction Model