

# DUNCAN INTELLIGENCE

Unforgettable People—Legendary Service • Edited by Jon Dodson • Fall 2000

## More About The N1 DEEC

Looking toward the future, installation of N1 DEECs will eventually allow for customized maintenance schedules for operators, based on how they operate their engines. While in operation, the N1 DEEC is constantly recording two different categories of engine data; one can be considered log book type information including vital engine statistics such as N1/N2 rolldown times, performance data, life limited component counts, starts/faults/auto-ignition times, event records, N1/N2 and ITT exceedances and PLA usage; the other could be labeled Jet Care/Troubleshooting data such as N1/N2 major speed cycles, N1/N2 minor speed cycles, thrust reverser N1/ N2 major speed cycles, ITT peak average temps and ITT minor cycles.

This data, stored and downloaded as engine condition trend monitoring (ECTM), can be used to construct an actual model of usage for a particular engine, providing vital information about engine usage, wear & tear and eventually tailoring a maintenance schedule for MPIs and core zone inspections based on how an operator operates their engine.

Currently, the established periodic inspection intervals are derived by a series of assumptions which lump the operators into a single category. (Example: Each operator uses full power at every takeoff for five minutes.) Some operators may use reduced power takeoff whenever possible, thus reducing actual wear and tear on the engines. The DEECs will record the information for ECTM download and reflect the actual operating data.

At some point in nearly every TFE731 engine's life, an N1 DEEC will be introduced as the electronic engine control. The older analog EECs will

become harder to support as their components become obsolete. The technology contained in the DEEC opens up a world of possibilities, not only addressing the logistical support issues of the older technologies, but in unlocking the true potential of the engine and reducing the cost of ownership to the operators.

Most of us today are somewhat apprehensive about new technology and would rather wait until the initial "bugs" are sorted out, letting others experience the growth pains of new technology. As with any new technology there were some initial software adjustments to the N1 DEEC that needed some sorting out. The good news is that these adjustments have been accomplished, the software upgrade has been proven and was certified on Oct. 18 by Honeywell and the FAA.

Some of these issues involved Lear applications that demonstrated some isolated cases of engine oscillations with anti-ice on, a max N1 overshoot and one occurrence of an uncommanded acceleration. The latest software upgrade has eliminated all but the uncommanded acceleration which was an unduplicated and isolated event. This acceleration can happen so slowly that the pilot may not recognize it until the engine has already gone beyond the desired N1 setting. Another update scheduled for Spring 2001 will include a new fault code and an alert by means of the computer light to warn the pilot of an uncommanded acceleration. This annunciator warning will give the pilot the opportunity to select the computer off should the engine move towards an uncommanded setting. The DEECs currently in service are easily upgraded with the new software in the field.

*For TFE731 technical info, we have the experts with whom you should speak.*

*Our 731 Engine Teams consist of technicians with hundreds of combined years of experience.*

*Need technical advice? Call Duncan's 731 Tech Rep, Doug Alleman, at 402.479.1689*

*In Lincoln, NE, contact **Jon Dodson**  
at **402.475.2611** or **1.800.228.4277***

*In Battle Creek, MI, contact **Dan Arrick** at  
**616.969.8400** or **1.800.525.2376***

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