AIR TRANSPORT

ENGINE DEVELOPMENT GUY NORMIS / LOS ANGELES

Rolls-Royce to ship Trent 800 fix

Manufacturer plans two-phase upgrade to tackle powerplant performance deterioration in hot and heavy conditions

An upgrade package to tackle faster than expected performance deterioration on Rolls-Royce Trent 800s operating in hot and heavy conditions is expected to be shipped to Boeing 777 operators by year-end.

The upgrade, designated the 895C, comes in two main phases, the first part of which is already being retrofitted during maintenance downtimes. The initial upgrade consists of improved high pressure (HP) and intermediate pressure (IP) turbine seal segments which have been revised with improved cooling and materials resistant to higher temperatures. The more resilient material is being used in the abradable honeycomb of the seal and the solid backplate supporting it. The latter is now made using “a single crystal style of material”, says Trent 800 chief engineer Andy Geer.

The second part of the upgrade consists of an enhanced cooling and thermal barrier coating (TBC) treatment for the IP and HP nozzle guide-vanes. The TBC material, already used in the Trent 500, covers the guide-vane platform and is being extended to cover the vane, adds Geer. “Hardware will be delivered at the end of the year in new engines, as well as being available for retrofit,” he says.

The improvements counter “more rapid thermal deterioration than expected” on higher-power Trent 895s, particularly on 777-300s flown by Dubai-based Emirates, which is expected to be a key beneficiary of the 895C package (Flight International, 19-25 November). Geer says that time-on-wing is expected to improve by “at least 25%” as a result of the changes.

R-R, meanwhile, says inspections of the suspect 892 engine operated by Thai, which was shut down on approach to Taipei on 11 November, has shown the problem was “maintenance-related”.

Although the engine-maker declares to detail the cause, it is believed to have to do with detachment of part of the recently overhauled annulus.

TESTING

First 900 trials finish

Rolls-Royce has completed the first rig tests of an advanced, low-weight fan-containment system for the Trent 900, destined for the Airbus A380.

Tests, although conducted on a 2.47m (8.1ft) Trent 500-sized fan assembly and containment unit, effectively served as a good proof-of-concept test of the scaled-up Trent 900 system, says chief engineer Rocs Savidge. A second full-scale rig test with a 2.94m diameter Trent 900 fan set is due for mid-2003, with the final full engine containment test in February 2004.

The revised containment design, adopted around a year ago as part of weight-saving efforts, “is lighter than the standard aluminium/Kevlar size-for-size, so we can transport it in a [Boeing] 747”, says Savidge.

The first full Trent 900 engine run is due in mid-March, while flight tests are planned for May 2004 on the same Airbus A340 testbed that was used to evaluate the Trent 500 in 2000.

SAFETY DAVID LEARMOUNT / LONDON

Interim Crossair crash recommendations suggest human error

A lack of evidence of any aircraft or navigation aid malfunction has led German accident investigators to focus on human factors in most of their interim recommendations relating to last year's Crossair BAe Systems Avro RJ100 crash in Germany. The aircraft crashed into a forest on a poor-weather night approach to runway 28 at Zurich airport, Switzerland, on 24 November 2001 (Flight International 4-10 December 2001).

The recommendations passed by the German accident investigation agency (BFU) to the Swiss federal aviation authority are effectively aimed at the recently restructured airline Swiss, of which the former Crossair is now part. The BFU said the airline's crew-pairing practices should be better defined. Swiss says in this case it believes that the BFU refers to the fact that, although the captain was experienced, he had recently been the young co-pilot's instructor, possibly making the co-pilot less likely to challenge the captain's actions.

Pilot selection and training, says the BFU, should take account of gaps in each pilot's performance or knowledge, but the agency was not specific about why the recommendation was made. The RJ100 accident, however, is one of two fatal Crossair crashes being investigated, the other being the 10 January 2000 loss of a Saab 340 on departure from Zurich, which is believed to have resulted from pilot disorientation leading to loss of control.

The BFU says all completed studies indicate there was no malfunction of the aircraft or the ground-based navigation equipment. Other recommendations include:
- airlines should be cautious about changing the manufacturer's recommendations for procedures in non-precision approaches;
- new-generation aircraft should be fitted with enhanced ground proximity warning systems (EGPWS). The Crossair aircraft had standard GPW5;
- checks should be made to ensure that weather information available to Zurich air traffic control for the relatively little-used runway 28 approach is good enough;
- air traffic control should have a minimum safe altitude warning system for the runway 28 approach as it has for 14 and 16;
- the Swiss aviation authority should ensure that Jeppesen approach charts show all flight obstacles on approaches.

The crew had originally been cleared for an instrument landing system (ILS) to runway 14, but at 22.00, a recently approved noise abatement procedure came into force that meant they had to change to a VOR/distance measuring equipment approach to 28 instead. The BFU has made no recommendations so far about the effect of noise abatement rules on safety, but a recommendation was made soon after the accident to install an ILS for runway 28, and this has been approved.