

## SECURITY

## Singapore works on anti-missile technology

Singapore's defence ministry is developing an anti-surface-to-air missile system for the nation's commercial aircraft ranging from the Airbus A320 family through to widebody aircraft such as the A380 and Boeing 747-400.

The ministry says the Singapore government has asked it to develop the technology in conjunction with foreign defence manufacturers.

Industry sources say Singapore has been briefed on Israeli company Elta's Flight Guard system, and the country will monitor the introduction of the system on Israeli airliners later this year before deciding whether to proceed.

The ministry says the anti-missile system will be ready for commercial use in two years and the government eventually wants the system installed on all of Singapore Airlines' (SIA) and subsidiary SilkAir's aircraft.

Singapore's military aircraft such as Lockheed Martin C-130 Hercules transports, one of which is serving in Iraq, are fitted with anti-missile systems, but none of the country's commercial aircraft have such systems.

SIA's passenger fleet comprises over 90 aircraft – A340-500s, 747-400s and Boeing 777s – with A380s due for delivery from early 2006. SilkAir operates 10 A320-family narrowbody aircraft.

## POWERPLANTS GUY NORRIS / LOS ANGELES

## R-R ships first Trent 900 for A340 testbed flights

Work also begins on "Build3" production standard engine for first A380 shipset

Rolls-Royce has shipped the first Trent 900 to Toulouse for installation on the Airbus A340-300 testbed in preparation for the start of flight tests that are due to begin around mid-May.

Assembly work also started around 16 February on the first "Build3" production-standard engine that will form part of the shipset for the first A380. The entire shipset is due to be delivered to Airbus in the build-up to the planned first flight of the A380 – still officially targeted for the first quarter of 2005.

Certification is also on schedule for the end of October, says Trent 900 chief engineer Rob Savidge, who adds that the A340 flight tests are partially aimed at confirming the initial performance results coming from a ground-test engine under evaluation at the Arnold Engineering Development Center (AEDC) in Tennessee. Specific fuel consumption on the engine at AEDC has been within 1% of guarantees, and was achieved with a "Build1" bill of materials, says Savidge.

The engine has subsequently been fitted with a "Mark 2" high-pressure compressor incorporating longer-life materials and some minor aerodynamic enhancements. The AEDC engine is the third of seven ground-test powerplants involved in the Trent 900

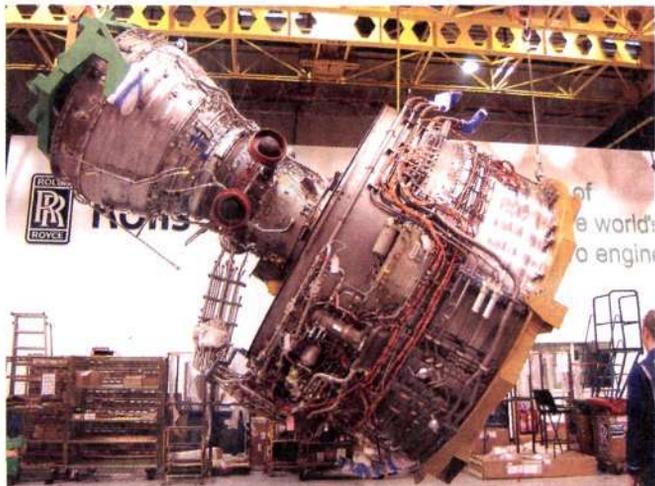
certification and test programme, the first of which is being prepared for water ingestion tests having completed low- and intermediate-pressure (LP/IP) system aerofoil stress surveys.

Development problems have been encountered on the fourth "type test" engine that suffered a low-pressure turbine failure, later attributed to a loose seal segment.

"We had completed 115h of type testing when we had the LP turbine failure," says Savidge, adding that the "problem was solved and a modification for it was developed by the IPT [of Spain] design team, which turned it around quickly". The modification involves axial

strengthening of the seal segment and retaining ring to prevent loosening of the segment and nozzle guide vanes, one of which fell out and hit two LPT blades.

Engine five has been used for blade flutter tests and, following nacelle and thrust-reverser work, will undertake the full 2.5kg (5.5lb) bird ingestion test in May. Engine six will undertake a 3,000-cycle endurance test set to run from 20 February until July, while engine seven will be used for the destructive fan blade-off test set for late June. This will evaluate redesigns to the powerplant's inlet and titanium fan casing triggered by results from earlier rig tests.



The A380's Trent 900 should begin flying on the A340 testbed in mid-May

## FREIGHT LEITHEN FRANCIS / SINGAPORE

## Australian start-up plans to bridge cargo gap

A new Australian cargo airline has been set up by a group of Sydney investors and former Ansett Australia employees, and plans to launch operations in mid-year using four Boeing 757-200Fs.

Australian Challenge Airways (ACA) is headed by Sydney-based Neil Hansford, chairman of aviation consultancy Strategic

Aviation Solutions and a former executive director of Ansett Air Freight in Australia as well as TNT Express in Europe. He says that undisclosed Sydney investors are bankrolling the start-up, which is aimed at a perceived gap in the Australian cargo market.

Hansford says ACA expects its air operator's certificate application

will come through in June.

ACA – which will be based in either Sydney, Brisbane or Melbourne – plans to start operating in mid-2004, on domestic as well as international routes between Australia and Asia, says Hansford. ACA is in the process of negotiating a contract with the Melbourne maintenance company,

which was previously part of Ansett Australia.

Qantas and Australia Post, which jointly own Australian Air Express, dominate the local air cargo market. In October, Australian freight operator TransAustralian Air was disbanded and in December Qantas and Australia Post acquired road freight operator Star Tracks.