Hartzell will produce UDF blades

PIQUA

Production of composite fan blades for General Electric's Unducted Fan engine is to be carried out by Ohio-based Hartzell Propellers. A memorandum of understanding between the two companies was signed late last year, enabling Hartzell to cooperate in the design, development, and manufacture of a set of blades for the proof-of-concept engine.

The UDF has been running since its initial test last year with propulsor blades manufactured by General Electric. These were of spar-shell-type construction, in which a composite shell surrounds a metal spar attached to the hub. In mid-February the UDF suffered a propulsor failure when the composite element of one of the blades separated from the spar.

Outdoor testing restarted with new blades, and the engine is due to be shipped to the Mojave Desert soon to be readied for flight-tests aboard a converted Boeing 727 in July or August. For these tests the UDF will fly with blades manufactured under the agreement with Hartzell.

General Electric says it has been working with Hartzell for one and a half years on UDF blades. The propeller manufacturer is geographically close to GE, and has a long-standing reputation for composite blade manufacture. This will be an asset in the UDF certification process, says Ames. A version of the company's Kevlar shell surrounding a metal spar attached to the hub will be used.

Either the UDF will be allowed to match propeller retention standards, or it will have to meet the criteria set for turboprop blade containment, in which case the retention standards will be much tougher.

Hartzell began development of structural composite propeller blades in 1973. The blades are manufactured from a Kevlar shell surrounding a polyurethane foam core, have unlimited service life approval on several aircraft.

Production PW4000 runs

EAST HARTFORD

Pratt & Whitney has run the first production PW4000 turbofan on schedule. The engine was assembled in one-third the time needed for its predecessor, the JT9D, because of its simplified design, the company says.

The first two production engines will be shipped to Airbus Industrie this summer to take part in the A310/PW4000 certification programme. Certification of the combination is set for April 1987. Federal Aviation Administration certification will follow a month later.

The first application for the PW4000 will be aboard the 12 A310-300s ordered by Pan Am in January 1985. The next sale was to Northwest Airlines, for 48 PW4000s to power the Boeing 747-400, marking the launch order for this aircraft.

Pratt & Whitney has signed a total of five production agreements with foreign manufacturers, giving them a total of 10 per cent of the PW4000 workshare. The latest, Japan's Kawasaki Heavy Industries, was signed up last September. KHI took a 1 per cent share, joining Italy's Fiat (2 per cent), Norway's Kongsberg Vapenfabrikk (3 per cent), Belgium's Fabriche National (3 per cent) and South Korea's Samsung Precision Industries (1 per cent).

The PW4000 is aimed at all the new widebody twins, including the Airbus A330. It is also offered for the McDonnell Douglas MD-11 and all marques of Boeing 747. The engine competes principally with General Electric's CF6-80C2, which has been selected so far to power Thai Airways International's A300-600s, Air India's A310-300s and, recently, Varig's Boeing 767-200ERs.

Pratt & Whitney says that the PW4000 will burn up to 7 per cent less fuel than the JT9D-7R4, latest marque in the series, and have substantially lower maintenance costs.

Engines compete for drone business

LONDON

With a potential Royal Navy requirement for a ship-launched target drone in mind, Flight Refuelling is test-flying its Falconet remotely piloted vehicle powered by two competing engines offering improved performance.

The existing ground-launched Falconet used by the British Army is powered by a 180lb-thrust Microturbine T9S18-075 turbinejet, built under licence in the UK by Ames Industrial. The drone takes off under its own power from a circular runway, or carousel.

The naval requirement calls for "zero-length" rocket-assisted launch from a deck-mounted rail. To provide the required extra performance, particularly take-off thrust, two engines are being evaluated: the Ames Industrial TJA24-1 and the Noel Penny Turbines NPT 301-2.

The TJA24-1 is an Ames development of the existing Falconet engine, producing 30lb thrust within the same casing. Speeds in excess of 380kt at 83 per cent power have been achieved in flight trials, says Ames. A version producing 405lb thrust within the same casing diameter is under development.

The Falconet has exceeded 400kt at low level when powered by the NPT 301-2, says Noel Penny Turbines. The engine produces 300lb thrust, with immediate power to 530lb available and to 400lb in the longer term. The NPT 301-2 is currently in production for a South Korean application.

Claims made by NPT for its engine include lower cost, a fuel consumption 20 per cent better than that of the competition at 1.03 lb/lb/hr to 1.06lb/lb/hr, and the ability to provide 2.5kVA of power. Ames counters that its engine is smaller and lighter, and includes a 2.5kVA high-speed alternator in development for the TJA24-1.