UDF on target, says GE

EVENDALE

General Electric pronounces itself "extremely confident" of its unducted fan (UDF) as a result of the development programme to date. Programme manager Bruce Gordon says that mechanical integrity appears good, UDF models having been tested throughout their performance envelope with no sign of flutter.

If all goes well, a UDF production commitment will be made at the beginning of 1987, says Gordon, following the first flight of the engine aboard a Boeing 727 in mid-1986. The engine is on schedule for its first test in mid-summer.

A question mark still hangs over the UDF's acoustic performance, however, which most agree will have to be at least comparable with that of today's turbofans. Gordon says that the noise margins are not yet big enough to satisfy local communities, but he is certain that they will be met in time for service entry.

Acoustic tests of a powered scale UDF model have just started at GE's Evendale plant. Tests on different aerofoils continue, and three blade shapes have been tried so far, with varying sweep angles and "activity factors" (equivalent to blade number).

Criteria for the UDF fan have been taken from GE's computer model for turbofans, which relates very well to the new engine, says Gordon.

General Electric claims that UDF will burn 40-60 per cent less fuel than current turbofans, and is certain that airframe manufacturers are looking for this kind of technology jump in the next generation of engines. It is working closely with Boeing, which is backing UDF to the extent of running windtunnel tests. In London last week, Boeing executive vice-president Joe Sutter said that a UDF-powered airliner is one of two 100-150-seater aircraft actively being considered for service entry in early 1992, the other being powered by IAE's V.2500. Flight understands, however, that Boeing is strongly in favour of the UDF concept (assuming the environmental problems are surmounted), because it wants its next generation airliner to be a highly visible technological step ahead of the A320 and MD-80.

UDF certification requirements are likely to be similar to those for other open-bladed propulsors, says Gordon. The plane of rotation of the contra-rotating unducted fans will be behind the aircraft's rear pressure bulkhead, reducing the likelihood of catastrophic damage in the event of blade failure. UDF tip speeds will be around 800 ft/sec, resulting, says GE, in circumferential stresses comparable with those of a propeller. Tip speeds in the model are higher, at 900 ft/sec.

Garrett proves F.109

PHOENIX

Garrett's engine for the Fairchild T-46A, the USAF's new basic trainer rolled out two weeks ago, has passed a "strenuous" accelerated mission test (AMT) before it has flown. It is the first time the AMT has been carried out before flight clearance.

The F109 successfully completed 325 AMT cycles, equivalent to 453 hr of in-service operation, and achieved over 3,900 idle-maximum power-idle transients. At the end of the test the 1,330 lb thrust turbosfan demonstrated full power without a significant change in fuel burn, or in gas temperatures. Hardware condition, says Garrett, was excellent.

The first engine to be developed under Garrett's new ENSIP (Engine Structural Integrity Programme), the F109 is designed to last for the entire 18,000 hr life of the airframe. ENSIP, says Garrett, is a "disciplined approach to design, manufacturing and inspection, which will extend engine inspection time and reduce maintenance costs".

Based on the core of the TFE731 civil turbofan and T76 turboprop, the F109 first ran in December 1983. Value of the initial contract is $121 million, covering design development and delivery of 29 engines, with options on a further 119. Future contracts could lead to orders for 1,430 T-46A engines, plus spares.

The first flight of T-46A and F109 is set for April, with production deliveries due to start at the beginning of next year.

Full power for PW209T

MONTREAL

Pratt & Whitney of Canada has run its prototype PW209T aerodynamic demonstrator to its full rating. The 209T is the first development engine in the PW200 series, and is designed primarily for twin-engine helicopters.

The first full-engine run is expected at the end of this year, with ground-test engine deliveries expected in the middle of 1986, just before flight-test engine deliveries. Certification is anticipated in early 1988. Hamilton Standard will provide a full authority digital electronic control (Fadec) system. Bell has selected the 209T for the 400A, which should enter production in 1988. The second engine in the series—the PW205B—will be fitted in Canadian-built B105s. The 205A will be a turboprop engine.

An increase in the production capacity of Pratt & Whitney's Canadian offshoot is to be achieved through a programme of expansion and modernisation. A new $90 million plant is to be built near Halifax Airport for production of high precision light alloy engine cases, and is due to open at the end of 1988.