Bird ingestion

SAFRAN Helicopter Engines – Jean-Luc THOUVENOT

EASA
European Aviation Safety Agency

CAAC

EU-CHINA
中欧民航合作项目
APP

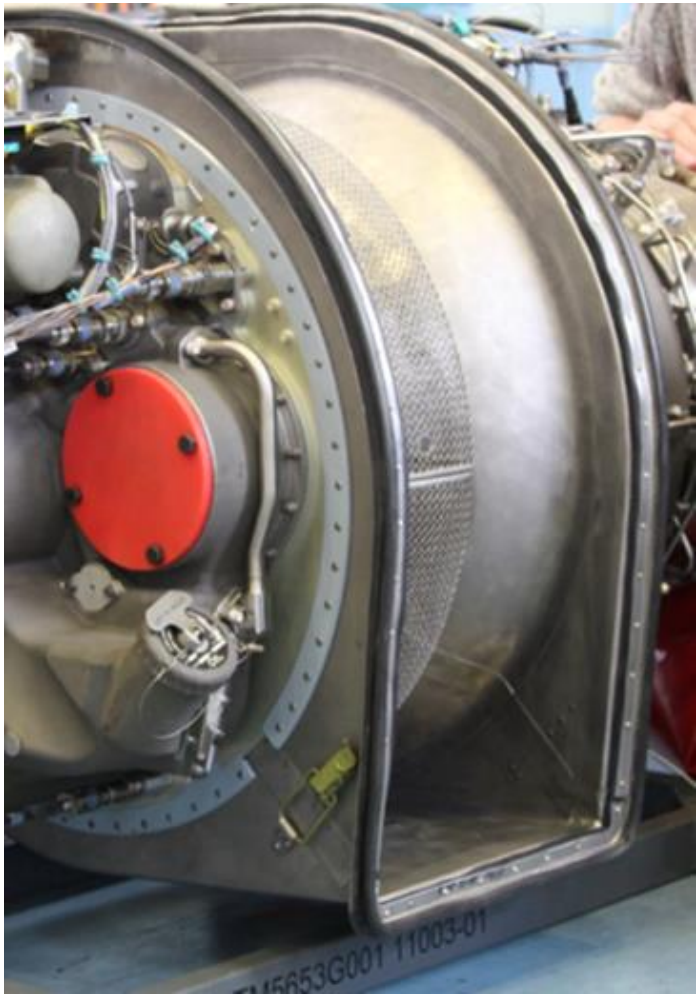
CS -E 800 Birds strike and ingestion at SafranHE

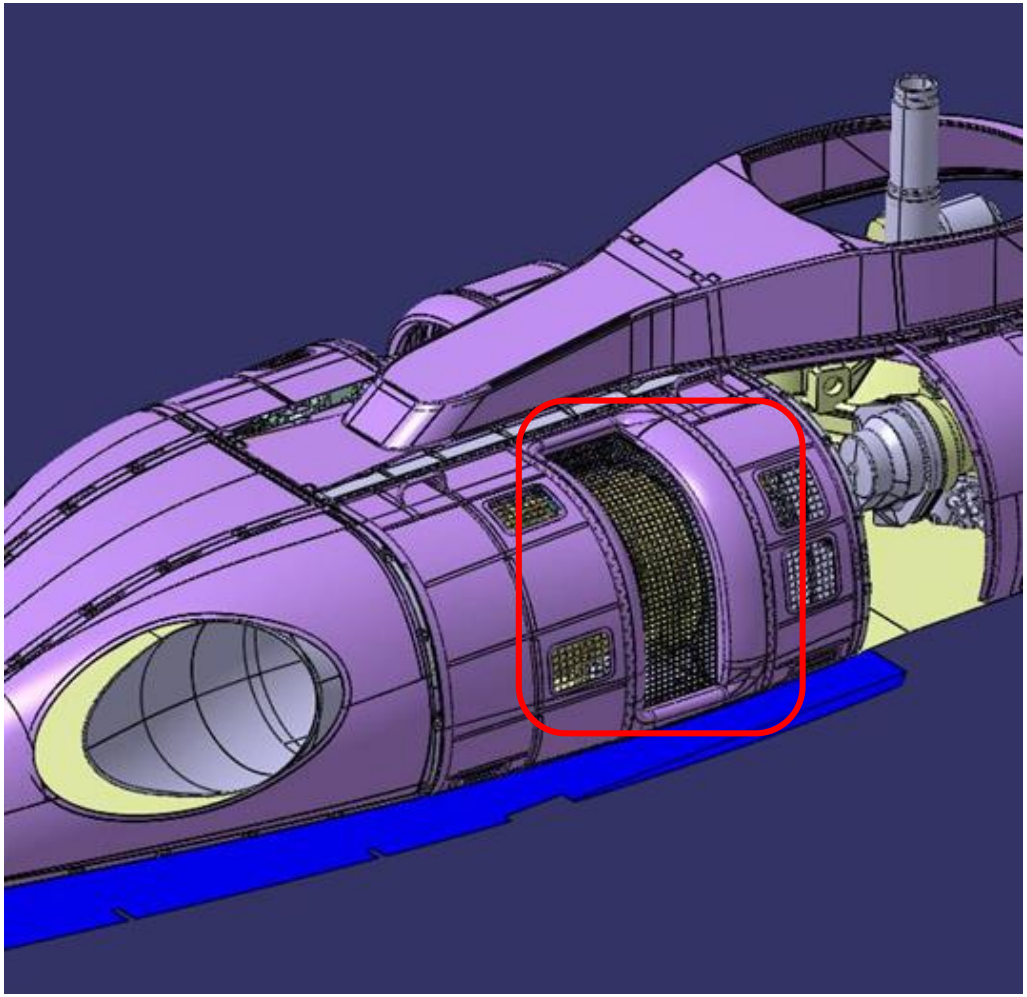
- Bird ingestion threat particular on helicopter engines due to specific and various engine installations
- All SafranHE helicopter engines but one exception, are protected against birds and hail by H/C grid

➔ Classic means of compliance at SafranHE: specification of H/C protection in the engine installation manual and engine TCDS, using CS-E 800 (f) (6) provision

If compliance with all of the specifications of CS-E 800 is not established, the Engine approval will be endorsed accordingly by restricting the Engine installations to those where birds cannot strike the Engine or be ingested by the Engine or adversely restrict the airflow into the Engine.

Example of helicopter grid at engine air intake



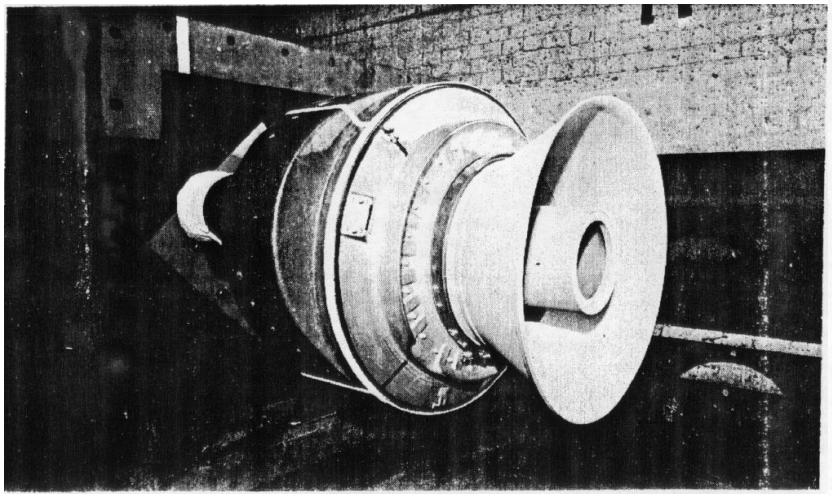


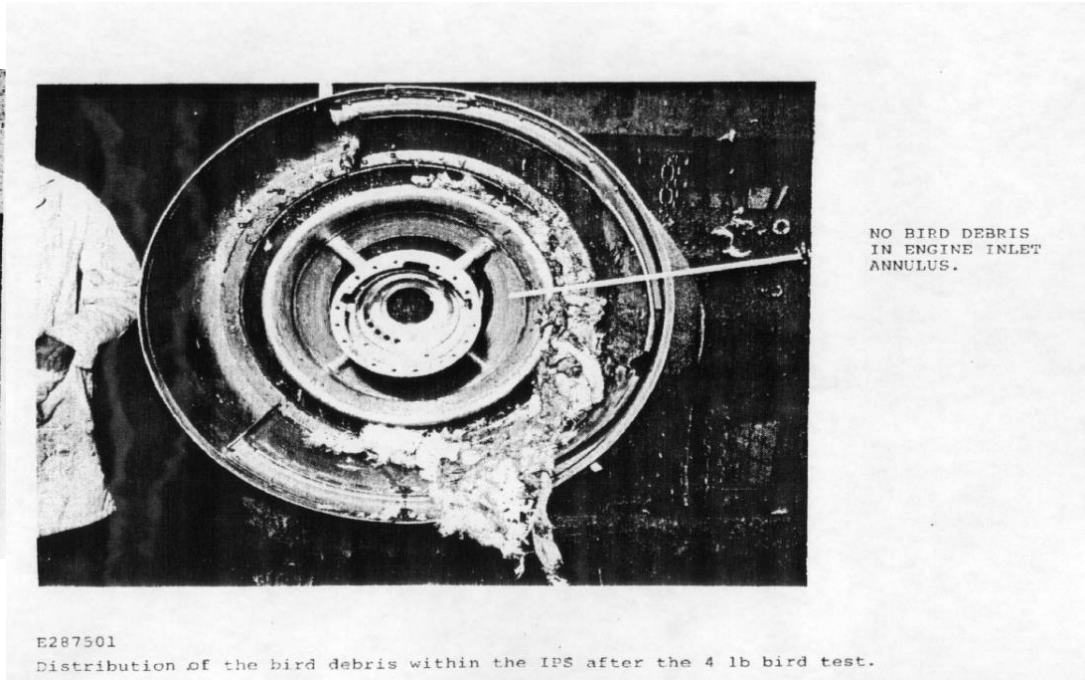
CS -E 800 Birds strike and ingestion at SafranHE

- It is also possible, as specified in CS –E 800 (f) (7), not to justify medium or small birds on engines installed on multi-engine rotorcraft (CCAR/FAR 33.76 (c) (10) only allow an exception for medium birds)
- This exception was granted following a study of bird strikes showing a very limited number of birds ingestion at engine air inlet for multi-engine rotorcraft
- Therefore, for EASA certification, only the large bird justification (no Engine Hazardous Effect) may be required

Large bird ingestion test on RTM 322 01/1

- 1,85 kg bird fired in the engine IPS Inlet Particle separator (without any running engine) the bird was struck in the IPS





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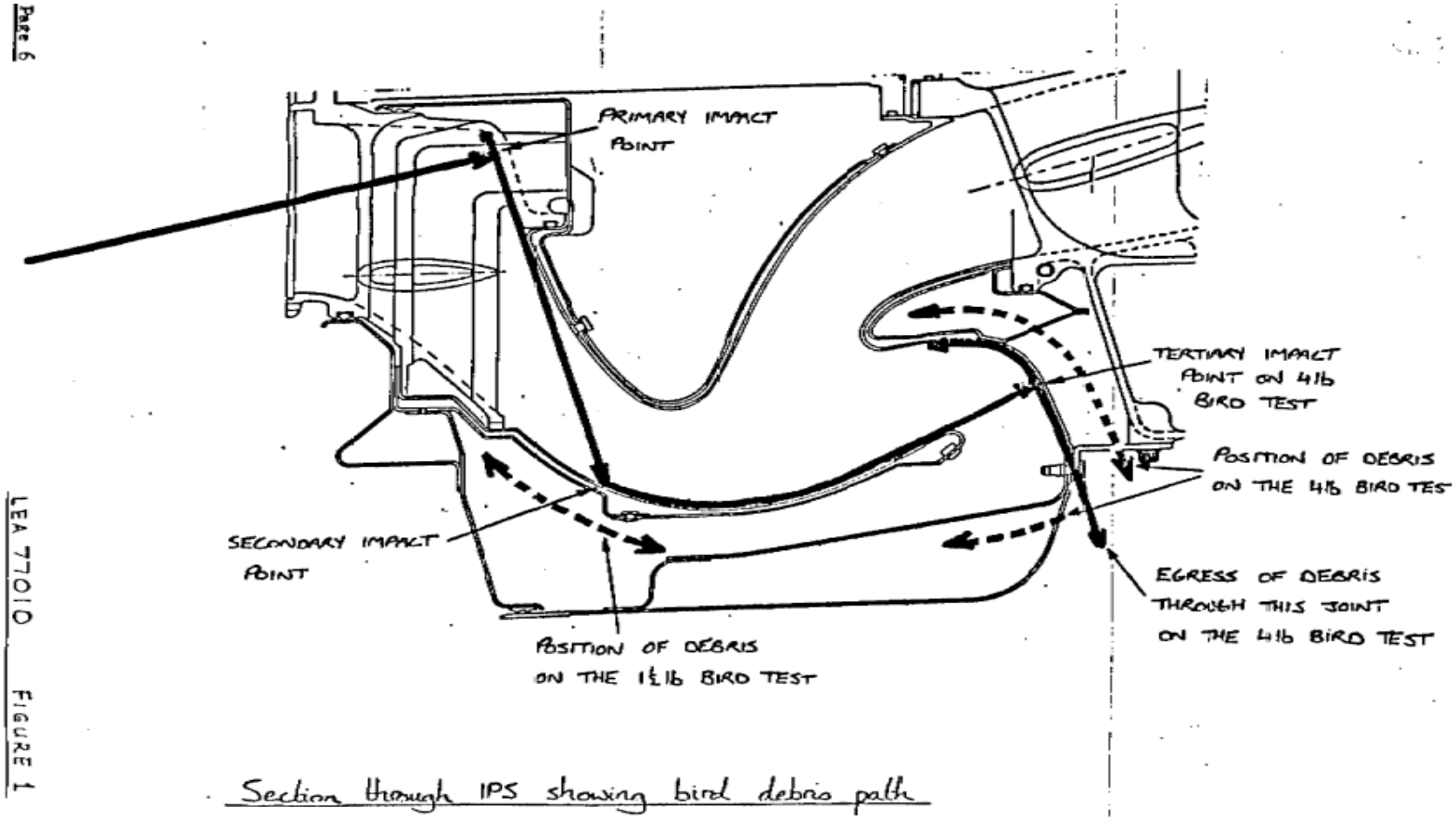
Distribution of the bird debris within the IPS after the 4 lb bird test.

Large bird ingestion test on RTM 322 01/1

Trajectory of the bird



LAST SLIDE

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