



MINISTÉRIO DA ECONOMIA E DO EMPREGO

GABINETE DE PREVENÇÃO E INVESTIGAÇÃO DE ACIDENTES COM AERONAVES GPIAA

AIRCRAFT INCIDENT REPORT

The investigation of this incident was started by an investigator who ceased his collaboration with the GPIAA. This report was written based on information collected by this investigator.

This report is a process conducted for the purpose of accident prevention which includes the collection and analysis of information, the determination of causes and, when appropriate, the making of safety recommendations, in accordance with Annex 13 to the Convention on International Civil Aviation, with Regulation (EU) N° 996/2010 of the European Parliament and of the Council, October 20, 2010, and with paragraph 3 of art. 11 of Dec.-Law No. 318/99 of 11 August. It is not the purpose of any such accident investigation and the associated investigation report to apportion blame or liability.

Date/time: 04/01/2009@18:01	Hours: 18:01UTC ¹	Proc. nº: 01/INCID/2009
Operator: Air France	Type of Incid.: In-flight engine shutdown	
Aircraft: AF 652, Boeing 777-300ER, F-GSQN		
Local: Santa Maria Oceanic FIR (N31° 55' W36° 07')		
Flight Type: Transport	Phase of flight / Operation: In route	
Persons on board: 490	Crew: 15/ Pax: 475	Injuries: NIL
Damage to aircraft: NIL		

This report has been released in Portuguese and English languages. In case of conflict, Portuguese version will take precedence

1. FACTUAL INFORMATION

1.1 History of flight

On 4th January 2009, by 18:01, the Boeing 777-300ER, registration F-GSQN, AF-652, en route from Paris Orly "to" Fort de France ", with 15 crew members and 475 passengers aboard, suffered an engine failure that resulted in a message of " caution ENG FAIL L" and has led to stopping of the engine # 1.



Figure N° 1.

¹ The times referred to in this report are UTC = Coordinated Universal Time = UTC + 1:00

At the time of the occurrence the aircraft was flying over the Atlantic Ocean, 600NM to SW of the island of Terceira to where diverged and landed safely, by 20:00 UTC, at Lajes Air Base (LPLA).

The affected engine was installed in the aircraft since 9/29/2008 and had accumulated the flight hours and cycles that are listed in the next table:

ENGINE: GE90-115B, S/N 906283			
TSN (time since	CSN (cycles since new)	TSI (Time since inspection)	CSI (cycles since inspection)
8105 hv	1064	1140 hv	143

A maintenance team of Air France travelled to Lajes Air Base and has inspected the engine. The maintenance team has identified the failure of the "transfer gearbox" as the cause of the occurrence. The DFDR has been removed from the aircraft and sent to France to extract the RAW DATA.

1.2 Action taken by GE

Following the occurrence, GE has forwarded by all operators the following preliminary information:

"The purpose of this event is to inform GE90-115B operators of an engine in flight shut down and diversion that occurred January 4, 2009. The preliminary information reported is the engine experienced an uncommanded spool down of the fan and core rotors. The crew then performed an uneventful single engine landing at an enroute alternate airport. The event engine had 8,105/1,064 hours/cycles since new, and was originally at Boeing.

Ground inspections indicate the cause of this IFSD to be a failure of the transfer gearbox (TGB) horizontal bevel gearshaft. The TGB on the event was installed on June 28, 2008 and had accumulated 2,159/289 hours/cycles since new, and had been inspected in accordance with SB 72-263 (on-wing ultrasonic inspection) on September 16, 2008. The engine is reported to have accumulated 1,140/143 hours cycles since last inspection.

The last TGB horizontal bevel gear separation occurred in April 2008. Like the previous four events, records indicate this recent event TGB contains the original configuration gear, which does not include the shot peened damper ring groove, silver plated damper ring, nor removal of fretted ring groove surface material by rework.

GE recommends operators continue with the on-wing ultrasonic inspection program IAW SB 72-0263 and retrofit to the increased web thickness gear shaft program IAW SB 72-0272".

2. CONCLUSIONS

The engine shutdown occurred when the aircraft was flying at 600 miles from the nearest airport (Lajes Airbase) to where it diverged and landed safely.

The engine was inspected by maintenance team of the operator which has identified a failure of the transfer gearbox.

3. RECOMENDATIONS

3.1 Safety recommendations

NIL

3.2 Engine manufacturer's recommendations

The engine manufacturer reported the occurrence to the operators, with the following recommendation: *“GE recommends operators continue with the on-wing ultrasonic inspection program IAW SB 72-0263 and retrofit to the increased web thickness gear shaft program IAW SB 72-0272”*.

Lisbon, 27th September 2011

The Investigator in Charge



Fernando Lourenço