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Interim Statement IN-005/2014

Serious incident occurred on 9 March 2014 at Tenerife South / Reina Sofía airport (Santa Cruz de Tenerife, Spain) to aircraft Boeing MD-11, registration PH-MCU



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SUBSECRETARÍA

COMISIÓN DE INVESTIGACIÓN
DE ACCIDENTES E INCIDENTES
DE AVIACIÓN CIVIL

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COMISIÓN DE INVESTIGACIÓN DE ACCIDENTES E INCIDENTES DE AVIACIÓN CIVIL

Tel.: +34 91 597 89 63
Fax: +34 91 463 55 35

E-mail: ciaiac@fomento.es
<http://www.ciaiac.es>

C/ Fruela, 6
28011 Madrid (España)

Important notice

This document constitutes the interim statement envisioned in Article 16.7 of Regulation (EU) no. 996/2010 of the European Parliament and of the Council, as well as in paragraph 6.6 of Annex 13 to the Convention on International Civil Aviation. The statement includes the details of the progress of the investigation and the most important operational safety issues revealed to date. The information provided herein is subject to change as the investigation proceeds.

Pursuant to the contents of Regulation (EU) no. 96/2010 of the European Parliament and of the Council and of Annex 13 to the Convention on International Civil Aviation, the investigation is purely technical in nature and is not intended to determine or apportion blame or liability. The investigation is being conducted without necessarily resorting to evidentiary procedures and for the sole purpose of preventing future accidents.

Consequently, the use of this information for any purpose other than to prevent future accidents may result in faulty conclusions or interpretations.

Abbreviations

°C	Degrees centigrades
ATC	Air Traffic Control
ATPL(A)	Airline Transport Pilot License (Aircraft)
FL	Flight Level
h	Hour (s)
HPT	High Pressure Turbine
LPT	Low Pressure Turbine
n°	Number
N2	Rotation speed of the HP turbine/compressor assembly

DATA SUMMARY

LOCATION

Date and time	Sunday, 9 March 2014; 00:30 h
Site	Tenerife South/Reina Sofia airport (Santa Cruz de Tenerife, Spain)

AIRCRAFT

Registration	PH-MCU
Type and model	Boeing MD-11
Operator	Martinair Cargo

Engines

Type and model	Pratt & Whitney PW4000
Number	3

CREW

	Captain	First Officer
Age	47 years	40 years old
License	ATPL (A)	ATPL (A)
Total flight hours	15520 h	11620 h
Flight hours on the type	8304 h	3880 h

INJURIES

	Fatal	Serious	Minor / None
Crew			2
Passengers			1
Third persons			

DAMAGE

Aircraft	Minor
Third parties	None

FLIGHT DATA

Operation	Commercial Air Transport - Scheduled - International - Cargo
Phase of flight	Take-off

REPORT

Date of approval	25 February 2015
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1. SUMMARY OF THE FLIGHT

Aircraft Boeing MD-11, registration PH-MCU, was scheduled from Amsterdam (The Netherlands) to Viracopos (Brazil), with a step-over at Tenerife South/Reina Sofía airport (Spain)

During the take-off at Tenerife South, when the aircraft was at initial climb, the crew heard an anomalous noise and noticed that the aircraft yawed to the right. Shortly afterwards they felt vibrations and observed the engine indications, seeing that the parameters corresponding to engine n.º 3 were not normal. N2 was at 105% and the exhaust temperature was about 875°C.

They concluded that engine n.º 3 had suffered severe damage. They started to apply the pertinent procedure, and while doing it, they observed that the engine n.º 3 fire alarm activated.

The crew kept applying the procedure they were performing (applied when there is severe damage or engine fire). The fire alarm went off after discharging the first fire extinguishing bottle.

They decided to return to departure airport. They assessed the situation, and considering that the fire alarm had gone off and that they were in good condition to control the aircraft, they decided to discharge fuel in order to reduce weight at landing, before returning the Tenerife South airport.

They asked authorization to ATC to discharge fuel at FL070, being cleared to do so.

They climbed to FL070, and once the necessary fuel load was discharged, they proceeded to return to Tenerife South airport, where they landed without further notice.

Once in the platform a visual inspection was made, realizing that the engine n.º 3 had suffered an uncontained break, originated by a blade breakage. No fuel, hydraulic liquid or oil leaks were observed.

As a consequence of the breakage and the subsequent material output from the engine some damage was produced affecting:

- Pylon and engine n.º 3 nacelle.
- Right wing.
- Horizontal stabilizer.

2. STATUS OF THE INVESTIGATION

The investigation has focused in establishing the damage suffered in engine n.º 3, trying to identify its sequence. On that purpose the engine was detached and sent to the maintenance shop in Singapore, where the last overhaul had been performed. There the engine was disassembled and inspected.

All the damage of the engine, mainly affecting the four stages of the Low Pressure Turbine (LPT) have been identified and documented, and first hypotheses of the failure sequence have been established.

The second stage of the High Pressure Turbine (HPT) as well as all stage of LPT were sent to manufacturer facilities to further inspect them and perform the necessary metallographic analyses.

3. NEXT STEPS

The following steps are foreseen to being carried out:

- Measurement of HPT second stage.
- Measurement of all LPT stages.
- Metallographic analyses.

At the end of the investigation a final report will be published.