



EASA Safety Information Notice

No.: 2008-27

Issued: 02 April 2008

Subject: Water Contamination of Attitude Heading Reference System (AHRS) Computers

Ref. Publication: FAA Special Airworthiness Information Bulletin (SAIB) NM-08-15 dated 26 March 2008, Embraer Service Bulletin (SB) 145-21-0036 Revision 03 dated 16 December 2005 and Embraer SB 145LEG-21-0006 Revision 01 dated 17 December 2004.

Introduction: The Federal Aviation Administration (FAA) has published the referenced SAIB (attached as pages 2 and 3 of this notice) to alert operators, maintenance organisations and mechanics about reported service difficulties and possible safety issues associated with contamination of the Attitude Heading Reference System (AHRS) computers installed on Embraer EMB-135/145 series aircraft.

Applicability: Embraer EMB-135 and EMB-145 series aircraft, all Models, all serial numbers as specified in the referenced Embraer SB's.

Recommendation: Although it is recognised that the FAA is not the 'State of Design' authority for this type design, EASA fully endorses the FAA recommendations.

This Safety Information Notice is for information only; however, the Agency requests operators to report any AHRS failure to the National Aviation Authority of the State of Registry of the affected aircraft.

Contact: For further information contact the Airworthiness Directives, Safety Management and Research Section, Certification Directorate, EASA.
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SUBJ: Instruments: Contamination of the Attitude Heading Reference System (AHRS) Computers **SAIB:** NM-08-15

Date: March 26, 2008

This is information only. Recommendations aren't mandatory.

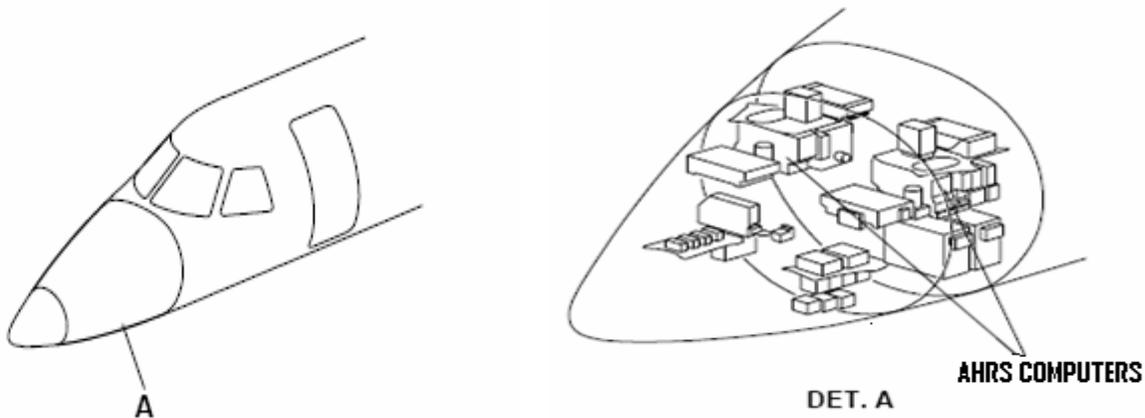
Introduction

This Special Airworthiness Information Bulletin alerts operators, repair stations, mechanics holding Inspection Authorizations (IA), Flight Standards District Offices (FSDO) Principal Maintenance Inspectors (PMI) and/or Principal Avionics Inspectors (PAI) of service difficulties and possible safety issues associated with contamination of the Attitude Heading Reference System (AHRS) computers for **EMBRAER Model EMB-135/145 airplanes**.

Background

A Model EMB-145 airplane experienced a loss of attitude and heading indications on the first officer's (No.2) primary flight display (PFD) followed by similar failure of the captain's (No.1) PFD. While returning to the airport, the captain's display indication returned to normal, and the airplane landed without further incident. Analysis of the corrosion residue found on the AHRS computers revealed that water was the likely source of contamination, which was the result of water condensation from the exhaust fans above the AHRS computers.

AHRS uses directional and/or magnetic source for navigation purposes. The AHRS (AH-800) measures the inertial motion, computed attitude, heading, angular rates, and linear acceleration of the airplane. The airplane has two identical and independent AHRS. The AHRS indications are shown on the PFD, multi-function display (MFD) and radio management unit (RMU).



Attitude Heading Reference System Computers (AHRS)

Operators have reported instances of water condensation in the forward electronic compartment and consequent water dripping inside the compartment. To mitigate the occurrences of water contamination and improve the system, Embraer installed a new protective shield assembly in the forward electronic compartment of in-production airplanes and issued Service Bulletins (SB) 145-21-0036, dated June 16, 2003 (original issue), and 145LEG-21-0006, dated July 01, 2004 (original issue), for the in-service fleet.

The FAA and the Agência Nacional de Aviação Civil (ANAC), which is the airworthiness authority for Brazil, reviewed Embraer's AHRS safety analysis and noticed that the probability of dual AHRS failure is very low (one reported event of dual failure in 5 million hours of fleet experience), since the contamination of both sets of equipment is progressive and independent. There is an independent integrated standby instrument system that is not susceptible to water contamination, so the loss of all attitude data is still considered to be extremely improbable. There has been a significant reduction in the number of the reported contaminated units since year 2002.

Recommendations

The FAA recommends installation of an FAA-approved protective device to reduce the risk of water contamination of the AHRS computers, thereby further reducing the probability of losing attitude and heading data and maintaining the redundancy of the AHRS. Operators may choose to develop their own protective device and work with their local FAA office to obtain FAA approval. One such device is the Embraer-designed protective shield, installed in accordance with the following (or later revisions) of the FAA-approved Embraer Service Bulletins:

Embraer Service Bulletin	Applicability	Revision Level	Date
145-21-0036	EMB-145, EMB-135	03	December 16, 2005
145LEG-21-0006	EMB-135BJ	01	December 17, 2004

For Further Information Contact

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