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APPENDIX: 4

BULLETIN TYPE: Flight Standards Information Bulletin for Air Transportation (FSAT)

BULLETIN NUMBER: FSAT 00-03

BULLETIN TITLE: Airbus Industrie A310 and A300-600 Series Airplanes –- Engine Fire Detection System

EFFECTIVE DATE: 02-22-00

TRACKING NUMBER: NTSB Recommendation A-99-33

APPLICABILITY: This bulletin is applicable to all Principal Operations Inspectors having oversight responsibility of operators who operate Airbus A310 and A300-600 series Airplanes.

NOTE: THIS BULLETIN REQUIRES PTRS INPUT, SEE PARAGRAPH 5.

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1. PURPOSE. The purposes of this bulletin are:

A. To ensure that flightcrews operating Airbus A310 and A300-600 series airplanes:

(1) Are aware of the importance of deactivating the faulted fire detection loop if an engine or auxiliary power unit (APU) fire warning changes to a loop fault;

(2) Know the proper methods for identifying a failed fire detection loop (unmodified A310 and A300-600 series airplanes only); and

B. To respond to National Transportation Safety Board (NTSB) Safety Recommendation A-99-33.

2. BACKGROUND. On July 9, 1998, an Airbus Industrie A300-605R, powered by two CF6-80C2A5 General Electric (GE) Aircraft Engines, experienced a fire in the No. 1 (left) engine shortly after takeoff. The flightcrew declared an emergency, initiated the in-flight engine fire procedure and returned to the airport. During the aircraft’s final approach the flight attendants informed the flightcrew that the engine was still on fire, and upon landing the flightcrew discharged the fire bottles. An emergency evacuation was performed and the fire was extinguished with the assistance of airport fire department personnel. Twenty-eight passengers received minor injuries during the evacuation.

A. National Transportation Safety Board Findings.

(1) Fire Warning and Flightcrew Actions. The investigation revealed that the flightcrew immediately retarded the No. 1 engine throttle after receiving the fire warning. According to the flight data recorder (FDR), the fire warning ceased after 88 seconds. The flightcrew subsequently selected the No. 1 engine fuel lever to "OFF" and discontinued the engine fire procedures without discharging the fire extinguishing bottles. Although the flightcrew followed its company's A300 Operating Manual Procedures (which were based on Airbus Flight Crew Operating Manual (FCOM) procedures), the investigation revealed inadequacies in the A300-600's in-flight engine fire procedures.

(2) Fire Loop System Design Anomaly. The NTSB investigation found that the engine fire detection system in the A300-600 consists of two identical but independent heat-sensitive fire loops and a fire detection control unit (FDC). Normal operation of the fire loops is with both systems ON, and when both loops are selected ON, each loop must provide either an overheat or fault signal to the FDC unit to trigger the fire warnings. If only one of the loops senses an overheat, a loop fault is generated. Additionally, if a loop failure occurs when a fire warning is active, the fire warning will cease, and a loop fault signal will be indicated. Should this occur, the faulty loop must be manually selected OFF to reacquire the fire warning. The NTSB is concerned that flightcrews of the A300-600 and A310 airplanes may be misled to believe that a fire has been extinguished when a fire warning is replaced by a loop fault.

(3) Cause of Engine Fire. Examination of the engine revealed that all of the accessory gearbox (AGB) adapter attachment bolt inserts had backed out. This allowed the fuel lines (cross-over tubes) to unseat from the adapter, thus permitting pressurized fuel to spray onto the hot engine parts and ignite. The adapter had been reworked in accordance with an August 25, 1994, GE Service Bulletin (SB) specifying new adapter inserts that were supposed to permit a higher bolt torque to eliminate fuel leaks from the adapter cross-over tube interface. The new AGB adapter inserts were found to be inadequate.

B. NTSB Safety Recommendations. Based on its investigation of the incident, the NTSB made three safety recommendations. The NTSB safety recommendation addressed in this bulletin is listed in subparagraph (1) below, while the safety recommendations in subparagraphs (2) and (3) are provided as information to the reader.

(1) NTSB safety recommendation A-99-33 recommends that the Federal Aviation Administration (FAA) issue a flight standards

information bulletin (FSIB) requiring principal operations inspectors (POI's) to emphasize:

(a) the importance of flightcrews deactivating the faulted fire detection loop if an engine or auxiliary power unit (APU) fire warning changes to a loop fault; and

(b) the proper method for identifying a failed fire detection loop (applicable to all Airbus A300-600 and A310 airplanes that have not been modified in accordance with the appropriate Airbus Service Bulletin to automatically arm the remaining fire detection loop).

(2) NTSB safety recommendation A-99-32 recommends that the FAA "issue an airworthiness directive to require that all operators of airbus A300-600 and A310 airplanes modify engine and auxiliary power unit (APU) fire detection systems to automatically arm the remaining loop for fire detection in the event of a single loop fault in the engines or APU."

(3) NTSB safety recommendation A-99-34 recommends that the FAA "require that Airbus include supplementary information to the in-flight engine fire procedure specified in the A300-600 and A310 Flight Crew Operating Manuals that indicates an appropriate amount of time flight crews should wait after the throttle is retarded to idle before the fuel lever is selected OFF and that all operators of A300-600 and A310 airplanes adopt the new Airbus in-flight engine fire procedure."

3. DISCUSSION.

A. Engine Idler Adapter Insert Redesign. Measures have been taken to correct the design deficiencies of the GE engine AGB idler adapter inserts that caused the engine fire. The FAA issued Airworthiness Directive (AD) 99-01-01, effective January 21, 1999, requiring compliance within 10 days of the effective date.

B. Fire Detection System Redesign. The civil aviation authorities of France and the FAA have both issued directives to correct design deficiencies in the A310 and A300-600 series airplanes fire detection system. On June 2, 1999, the DGAC[1] issued French AD 1999-238-286(B) requiring mandatory compliance with Airbus Service Bulletins. Pursuant to bilateral airworthiness agreements, the FAA issued AD 99-27-10, Airbus Model A310 And A300-600 Series Airplanes, for wiring modifications to the engine and APU fire detection systems. This AD became effective February 8, 2000, and within 24 months of the effective date, affected aircraft are required to be modified in accordance with the appropriate Airbus SB. Due to the time frame allowed for

[1] Direction Generale de l'Aviation Civile.

operators to comply with the wiring modifications AD, the potential for an unnoticed or uncontained engine and/or APU fire continues to exist until compliance with the AD.

4. ACTION. Principal Operations Inspectors having oversight responsibilities of operators of Airbus A310 and A300-600 series airplanes shall:

A. Provide a copy of this bulletin to each operator at the earliest opportunity; and

B. Ensure that the operator provides instruction to flightcrews regarding:

(1) The importance of flightcrews deactivating the faulted fire detection loop if an engine or APU fire warning changes to a loop fault; and

(2) The proper method for identifying a failed fire detection loop (applicable to all Airbus A300-600 and A310 airplanes that have not been modified in accordance with the appropriate Airbus Service Bulletin to automatically arm the remaining fire detection loop).

5. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) INPUT. Principal operations inspectors shall make a PTRS entry to record the actions directed by this bulletin. The PTRS entry for distribution of this bulletin to the operator shall be listed as activity code 1381, and the "National Use" field entry shall be listed as FSAT0003. The comments section of the PTRS shall be used to record interaction and response of the operator.

6. INQUIRIES. Flight Standards Air Transportation Division, AFS-200, with input from the Transport Airplane Directorate and the Seattle Aircraft Evaluation Group, developed this bulletin. Any inquiry from operators may be directed to the POI having oversight responsibilities at the Certificate-Holding District Office (CHDO) or Certificate Management Office (CMO). Principal operations inspectors and Regional Office staff may direct any inquiries to either Will Swank at (202) 493-4602 or Hop Potter at (202) 267-3723.

7. EXPIRATION. This bulletin will remain in effect until further notice.

/s/ Gary E. Davis, for
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