

DEPARTMENT OF TRANSPORTATION**Federal Aviation Administration****14 CFR Part 39**

[Docket No. FAA-2006-26110; Directorate Identifier 2006-NM-112-AD; Amendment 39-15585; AD 2008-13-22]

RIN 2120-AA64

Airworthiness Directives; Boeing Model 747-400, 747-400D, and 747-400F Series Airplanes

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain Boeing Model 747-400, 747-400D, and 747-400F series airplanes. This AD requires replacement of an electronic flight instrument system/engine indicating and crew alerting system (EFIS/EICAS) interface unit (EIU) located on the E2-6 shelf of the main equipment center with a new or modified EIU. This AD results from two instances where all six integrated display units (IDUs) on the flight deck panels went blank in flight. We are issuing this AD to prevent loss of the IDUs due to failure of all three EIUs, which could result in the inability of the flightcrew to maintain safe flight and landing of the airplane.

DATES: This AD becomes effective August 6, 2008.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in the AD as of August 6, 2008.

ADDRESSES: For service information identified in this AD, contact Boeing Commercial Airplanes, P.O. Box 3707, Seattle, Washington 98124-2207.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The address for the Docket Office (telephone 800-647-5527) is the Document Management Facility, U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue, SE., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Jay Yi, Aerospace Engineer, Systems and

Equipment Branch, ANM-130S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98057-3356; telephone (425) 917-6494; fax (425) 917-6590.

SUPPLEMENTARY INFORMATION:

Discussion

The FAA issued a supplemental notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an AD that would apply to certain Boeing Model 747-400, 747-400D, and 747-400F series airplanes. That supplemental NPRM was published in the **Federal Register** on August 23, 2007 (72 FR 48246). That supplemental NPRM proposed to require replacement of an electronic flight instrument system/engine indicating and crew alerting system (EFIS/EICAS) interface unit (EIU) located on the E2-6 shelf of the main equipment center with a new or modified EIU. We issued that supplemental NPRM to propose reducing the compliance time for replacing the EIU.

Compliance With AD 2004-10-05, Amendment 39-13635

We have determined that in order to comply with both this AD and the EIU replacements required by paragraph (d)(1) of AD 2004-10-05, at least one of the three EIUs must be part number (P/N) 622-8589-105 and the other two EIUs may be either P/N 622-8589-104 or P/N 622-8589-105. (The installation of P/N 622-8589-105 is required by paragraph (f) of this AD, and the installation of P/N 622-8589-104 is required by paragraph (d)(1) of AD 2004-10-05.) Boeing has confirmed that P/N 622-8589-104 and P/N 622-8589-105 are fully interchangeable and may be used in any combination. Therefore, we have revised paragraph (h) of this AD accordingly. In addition, we have removed the information that appeared in paragraph (b) of the supplemental NPRM and included it in paragraph (h) of this AD. These changes are necessary to ensure that operators are able to comply with both this AD and AD 2004-10-05, in light of the parts availability constraint.

Comments

We provided the public the opportunity to participate in the development of this AD. We have considered the comments received.

Support for the Supplemental NPRM

The National Transportation Safety Board (NTSB) supports reducing the compliance time from 60 months to 24 months. The Association of Asia Pacific

Airlines (AAPA) supports the intent of the supplemental NPRM.

Request To Extend the Compliance Time

Boeing, Korean Air, Japan Airlines, United Airlines, and the AAPA request that we extend the compliance time to 60 months for replacing at least one EIU. As justification for extending the compliance time, Boeing states that (1) the loss of primary displays has been demonstrated and certified as not being a catastrophic condition, (2) pilots are able to maintain continued safe flight and landing by using backup or standby instruments as certified, and (3) mitigating action has been provided with issuance of the Boeing 747-400 Flight Crew Operations Maintenance Bulletin (OMB) TB1-20, "Flight Deck Display Unit Blanking Anomaly," dated February 25, 2003, to the Boeing 747 Flight Crew Operations Manual. Boeing further states that the EIU manufacturer has advised that it has limited capacity to modify units, which needs to be taken into consideration in the fleet modification plan. Boeing also asserts that most operators will choose to modify all three EIUs simultaneously to ease configuration control and logistics.

AAPA states that its member airlines operate about 50 percent of the affected airplanes worldwide, and that none of its members have reported any blanking of all integrated display units (IDUs). AAPA further states that many of its members have already planned to replace all three EIUs, but that the 24-month compliance time will require them to change their existing retrofit programs to meet the new timeline. AAPA asserts this schedule change could involve removing airplanes from revenue service before scheduled maintenance, thus affecting their operational flexibility (capacity, manpower, and revenue generation). AAPA also states that the capacity of the EIU manufacturer must be considered at the global level, as many operators have already started their replacement programs based on replacing all three EIUs within a 60-month compliance time.

Korean Air states that the 24-month compliance time will impose an excessive burden considering the parts availability constraint. United Airlines and Japan Airlines state that replacing one EIU, instead of all three EIUs, creates a risk that the requirements of the AD could be inadvertently undone at a later time. They further state that replacing all three EIUs, which can be done only within a 60-month compliance time, will ensure that the

requirements of the AD cannot be undone.

We do not agree to extend the compliance time for any of the stated reasons. We also disagree with AAPA's assertion that none of its members have experienced blanking of the IDUs; we have received a report that one of its members experienced losing all IDUs on two Model 747-400 series airplanes. We have determined that a 24-month compliance time is the longest acceptable compliance time for ensuring that an acceptable level of safety is maintained, even with the mitigating action mentioned by Boeing.

While the loss of the primary displays, by itself, is not catastrophic in the same sense as other types of failures such as a major structural failure, it is still considered to be unsafe. When all primary displays are lost, flightcrew access to critical flight management information is denied and flightcrew workload could be significantly increased. In addition to the primary displays of airplane flight and navigation data, such information includes engine monitoring, depiction of hazardous weather and terrain, flightcrew warnings, fuel management, and other vital systems information. Access to this information is critical to the flightcrew's ability to maintain airplane control, positional awareness, and awareness of the airplane's condition. Conversely, a simultaneous loss of all of this information unacceptably degrades the flightcrew's ability to continue safe flight and landing. We have taken AD action on other airplane models that also experienced loss of the primary displays.

We recognize that operators would prefer to replace all three EIUs simultaneously for fleet management reasons, and that replacing only one EIU involves more complicated maintenance planning. However, operators' approved maintenance programs should provide sufficient controls to minimize the risk of releasing airplanes for service in a noncompliant condition. Further, the parts availability constraint will prevent operators from replacing all three EIUs on all affected airplanes within 24 months. The only course of action that likely can be supported with adequate parts availability for a 24-month compliance time is a requirement to replace one EIU. Although under the provisions of paragraph (i) of this AD, we will consider requests for adjustments to the compliance time if data are submitted to substantiate that such an adjustment would provide an acceptable level of safety. We have revised paragraph (i) of this AD to

specify the information that must be submitted with the request.

Request To Require Replacement of All Three EIUs

The NTSB reiterates its concern about requiring replacement of only one EIU. The NTSB states that, despite the intended redundancy of three EIUs, if only one EIU is replaced and that modified EIU suffers an unrelated fault removing it from operation, an airplane is still exposed to the potential for the IDUs to go blank since the other two EIUs would not have the auto-restart capability. The NTSB urges that we continue to work with the EIU manufacturer and operators to ensure that all three EIUs are replaced with new or modified parts in a timely manner.

We infer the NTSB requests that we revise this AD to require replacement of all three EIUs. Although we understand the NTSB's concern, we do not agree to revise this AD. We have performed a risk assessment of a modified EIU failing and have determined that the risk of failure of the modified EIU is remote enough that an acceptable level of safety is maintained by replacing only one EIU. Further, since we have reduced the compliance time, there are only enough modification kits available for all operators to replace one EIU per airplane within the 24-month compliance time. Further, operators have already indicated that, for fleet management reasons, they are likely to replace all three EIUs as more parts become available. Also, the unsafe condition has been further mitigated by the Boeing 747-400 Flight Crew OMB TB1-20, "Flight Deck Display Unit Blanking Anomaly." That document advises flightcrews of the problem and provides instructions for restarting the EIUs should there be a display blanking problem during operation. We have not revised this AD in this regard.

Request To Revise Work-Hour Estimate

AAPA states that the work-hour estimate in the supplemental NPRM is without basis, and that time to remove, install, and test the EIU must be included to accurately determine the time for performing the task. Based on operator experience, AAPA asserts that the EIU modification, replacement, and testing range between 6 to 40 hours per airplane.

We disagree with revising the work hour estimate. The cost information in an AD describes only the direct costs of the specific actions required by this AD. Based on the best data available, the manufacturer provided the number of work hours necessary to do the required

actions. This number represents the time necessary to perform only the actions actually required by this AD. We recognize that, in doing the actions required by an AD, operators might incur incidental costs in addition to the direct costs. The cost analysis in AD rulemaking actions, however, typically does not include incidental costs such as the time required to gain access and close up, time necessary for planning, or time necessitated by other administrative actions. Those incidental costs, which might vary significantly among operators, are almost impossible to calculate. Therefore, we have not revised this AD in this regard.

Conclusion

We have carefully reviewed the available data, including the comments received, and determined that air safety and the public interest require adopting the AD as proposed in the supplemental NPRM.

Costs of Compliance

There are about 639 airplanes of the affected design in the worldwide fleet. This AD affects about 79 airplanes of U.S. registry. The required actions take about 1 work hour per airplane, at an average labor rate of \$80 per work hour. Required parts cost about \$2,840 per airplane (for one EIU). Based on these figures, the estimated cost of this AD for U.S. operators is \$230,680, or \$2,920 per airplane.

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

We have determined that this AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on

the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a "significant regulatory action" under Executive Order 12866;
- (2) Is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

We prepared a regulatory evaluation of the estimated costs to comply with this AD and placed it in the AD docket. See the **ADDRESSES** section for a location to examine the regulatory evaluation.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

■ Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39—AIRWORTHINESS DIRECTIVES

■ 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

■ 2. The Federal Aviation Administration (FAA) amends § 39.13 by adding the following new airworthiness directive (AD):

2008-13-22 Boeing: Amendment 39-15585. Docket No. FAA-2006-26110; Directorate Identifier 2006-NM-112-AD.

Effective Date

(a) This AD becomes effective August 6, 2008.

Affected ADs

(b) None.

Applicability

(c) This AD applies to Boeing Model 747-400, 747-400D, and 747-400F series airplanes, certificated in any category; as identified in Boeing Service Bulletin 747-31-2368, Revision 1, dated July 24, 2006.

Unsafe Condition

(d) This AD results from two instances where all six integrated display units (IDUs) on the flight deck panels went blank in flight. We are issuing this AD to prevent loss of the IDUs due to failure of all three electronic flight instrument system/engine indicating

and crew alerting system (EFIS/EICAS) interface units (EIUs), which could result in the inability of the flightcrew to maintain safe flight and landing of the airplane.

Compliance

(e) You are responsible for having the actions required by this AD performed within the compliance times specified, unless the actions have already been done.

Replacement

(f) Within 24 months after the effective date of this AD, replace at least one of the three EIUs, part number (P/N) 622-8589-104, located on the E2-6 shelf of the main equipment center with a new or modified EIU, P/N 622-8589-105, in accordance with the Accomplishment Instructions of Boeing Service Bulletin 747-31-2368, Revision 1, dated July 24, 2006.

Note 1: Boeing Service Bulletin 747-31-2368, Revision 1, dated July 24, 2006, refers to Rockwell Collins Service Bulletin EIU-7000-31-502, dated March 21, 2006, as an additional source of service information for modifying an EIU by adding auto restart circuitry, which converts EIU P/N 622-8589-104 to P/N 622-8589-105.

Credit for Actions Done According to Previous Service Bulletin

(g) Actions done before the effective date of this AD in accordance with Boeing Service Bulletin 747-31-2368, dated November 22, 2005 (Revision 1 of the service bulletin specifies that the original issue is dated December 1, 2005), are acceptable for compliance with the corresponding requirements of paragraph (f) of this AD.

Terminating Action for AD 2004-10-05, Amendment 39-13635

(h) Replacing an EIU with a new or modified EIU in accordance with paragraph (f) of this AD constitutes terminating action for the EIU replacement of paragraph (d)(1) of AD 2004-10-05, provided that the other two EIUs are replaced with EIUs having P/N 622-8589-104 or P/N 622-8589-105. All other actions required by paragraph (d)(1) of AD 2004-10-05 must be complied with.

Alternative Methods of Compliance (AMOCs)

(i)(1) The Manager, Seattle Aircraft Certification Office, FAA, has the authority to approve AMOCs for this AD, if requested in accordance with the procedures found in 14 CFR 39.19.

(2) To request a different method of compliance or a different compliance time for this AD, follow the procedures in 14 CFR 39.19. We will only grant a compliance time extension for this AD if the requestor can show that it is unable to accomplish the minimum requirements of the AD (i.e., one modified EIU for each airplane) by the compliance time for reasons beyond its control, such as the inability to obtain enough parts to comply with the minimum requirements of the AD by the compliance time. Therefore, requests to extend the compliance time for this AD must include the following information:

(i) How many airplanes are included in the request,

(ii) An inventory of how many modified EIUs the requestor currently has on hand,

(iii) A forecast inventory showing that the requestor will not have enough modified EIUs available to accomplish the minimum AD requirements (i.e., one modified EIU for each airplane) by the AD compliance time, based upon the current inventory on hand and delivery rates from the parts supplier,

(iv) Documentation of supplier delivery commitments for modified EIUs or conversion kits, as applicable, including firm delivery commitment dates, that will provide the requestor with an adequate number of parts to be able to accomplish the minimum AD requirements on its affected airplanes, and

(v) Documentation of maintenance facility schedule availability for accomplishing the AD requirements on all airplanes included in the request. We will not approve AMOC requests that propose replacing or modifying all three EIUs in a time frame longer than 24 months instead of replacing or modifying one EIU within 24 months. Before using any approved AMOC on any airplane to which the AMOC applies, notify your appropriate principal inspector (PI) in the FAA Flight Standards District Office (FSDO), or lacking a PI, your local FSDO.

Material Incorporated by Reference

(j) You must use Boeing Service Bulletin 747-31-2368, Revision 1, dated July 24, 2006, to do the actions required by this AD, unless the AD specifies otherwise.

(1) The Director of the Federal Register approved the incorporation by reference of this service information under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) For service information identified in this AD, contact Boeing Commercial Airplanes, P.O. Box 3707, Seattle, Washington 98124-2207.

(3) You may review copies of the service information incorporated by reference at the FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington; or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

Issued in Renton, Washington, on June 8, 2008.

Michael Kaszycki,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

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