

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2001-NM-291-AD; Amendment 39-13640; AD 2004-10-10]

RIN 2120-AA64

Airworthiness Directives; Boeing Model 737-600, -700, -700C, -800, and -900 Series Airplanes Equipped With Certain Honeywell Start Converter Units

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), applicable to certain Boeing Model 737-600, -700, -700C, -800, and -900 series airplanes equipped with certain Honeywell start converter units (SCU). This amendment requires replacement of the SCU of the auxiliary power unit (APU) located in the electrical and electronics (E/E) compartment with a new or modified SCU. This action is necessary to prevent overheating of the electrical connector of the SCU, which could create an ignition source and possible fire in the E/E compartment and cause damage to certain electrical wire bundles on the E2-2 shelf. Such damage could result in loss of power from the APU generator, failure of electrically powered airplane systems, and consequent reduction in the ability of the flight crew to control the airplane in certain adverse operating conditions. This action is intended to address the identified unsafe condition.

DATES: Effective June 24, 2004.

ADDRESSES: Information pertaining to this amendment may be examined at the Federal Aviation Administration (FAA), Transport Airplane Directorate, Rules Docket, 1601 Lind Avenue, SW., Renton, Washington.

FOR FURTHER INFORMATION CONTACT: Stephen S. Oshiro, Aerospace Engineer, Systems and Equipment Branch, ANM-130S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 917-6480; fax (425) 917-6590.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) to include an airworthiness directive (AD) that is applicable to certain Boeing Model 737-600, -700, -700C, -800, and -900 series airplanes equipped with certain

Honeywell start converter units (SCU) was published in the Federal Register on August 9, 2002 (67 FR 51785). That action proposed to require replacement of certain SCUs with new, improved SCUs. The SCUs would be required to be replaced according to the Boeing 737-600/700/800/900 Aircraft Maintenance Manual (AMM) (the AMM includes procedures for Model 737-700C series airplanes).

Comments

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received.

Requests To Extend the Compliance Time

Several commenters request that the compliance time of 18 months specified in the notice of proposed rulemaking (NPRM) be extended. The following justifications were provided by several commenters in support of their request to extend the compliance time from the proposed 18 months to compliance times ranging from 36 to 60 months.

One commenter states that, rather than specifying new replacement SCUs as described in the "Cost Impact" section of the NPRM, the SCUs should be described as "modified." The commenter indicates that the time for rotation of an SCU through the modification program ranges from 40 to 45 days. The commenter expresses concern that the SCU manufacturer may not be able to support the proposed 18-month compliance time for all affected airplanes. For these reasons, the commenter requests that the FAA review any proprietary failure analysis of the airplane manufacturer to support a request for extension of the compliance time to 42 months.

One commenter states that it has two spare SCUs to be used in its replacement program, and that 54 airplanes of its fleet of 77 Model 737-800 series airplanes would require replacement. The commenter indicates that in order to meet the proposed 18-month compliance time, an additional two SCUs would have to be purchased at a cost of \$420,000. The commenter requests that, to prevent such an expense, the compliance time be extended to 36 months.

One commenter estimates that the time from shipment of a discrepant SCU to the SCU manufacturer for modification and acquisition of the modified part would be 45 days. The operator states that it would need the compliance time extended to 42 months in order to replace all 42 of its SCUs.

Another commenter states that it would need the compliance time extended from 18 months due to the large number of SCUs that it will have to modify. Additionally, the commenter states that it would need the compliance time extended because of the effect the large worldwide volume of SCUs will have on the SCU manufacturer's turnaround times. Therefore, the commenter prefers that the compliance time be extended to 60 months, if possible, but adds that it would be acceptable to extend the compliance time to 36 months.

Additional Requests and Reasons for Extending the Compliance Time

One commenter states that the service history of the Model 737-600, -700, and -800 series airplanes has shown that, in most cases, typical maintenance and operating procedures have limited the damage caused by failed electromagnetic interference (EMI) filter capacitors to the capacitors themselves. The commenter states that burning of the wire harness appears to occur only in conjunction with a high number of auxiliary power unit (APU) restart attempts with an illuminated APU fault light. The commenter states further that, of the six incidents that were reported as of the date of its comment submittal, only one resulted in burning the wire harness. That incident was discovered on an airplane that was being introduced into a domestic operator's fleet after having been operated by a non-U.S. airline. The commenter suspects that the SCU connector failure on that airplane was the result of being mishandled possibly by nonqualified personnel as evidenced by the 12 to 20 APU restart attempts made with an illuminated APU fault light.

One commenter, the SCU manufacturer, also states that the risk of an SCU connector overheat event that progresses to the point where aircraft wiring is damaged is considerably reduced if repeated APU start attempts are not made. The commenter also advises that it has issued a service information letter (SIL) that provides operators of the affected airplanes with direction regarding this issue. The commenter further states that, although the SIL is not an alternative method of compliance with the AD, it does provide additional protection against the identified unsafe condition. The commenter further states that the two events that occurred since the issuance of the service letter (August 16, 2000) were of reduced severity and no damage to the airplane wiring was recorded.

Another commenter, the airplane manufacturer, contends that, even in a worst case scenario, the risk to the fleet is minimal because the wiring damage does not present a hazard to the airplane or occupants. The commenter advises that an analysis was done for each system that could be affected and it was found that sufficient redundancy exists such that all potential combinations of lost functionality were extremely improbable. The commenter further advises that, since the SCU automatically removes power for this condition within 300 milliseconds, which limits smoke emission, the hazard presented by smoke or the smell of burning wires is minimized. Also, the wiring is self extinguishing and will not propagate fire and there are no flammable materials in the area. The commenter further notes that the electrical/electronic (E/E) bay is visually inspected per the zonal inspection program every 18 months or 4,000 flight cycles, whichever occurs first, for obvious unsatisfactory conditions, damage, failures, irregularities and/or discrepancies. In addition, the commenter specifies that the smoke clearing procedure can be used to eliminate any accumulated smoke and/or fumes.

Another commenter requests that the FAA review any failure analysis and extend the compliance time from 18 to 42 months.

The FAA agrees with the commenters' requests to extend the compliance time. However, we do not agree with certain commenters' justification for extending the compliance time solely on the basis of the potential disruption or negative impact on operator flight and maintenance schedules, or on other non-safety related aspects of airline operations. Those commenters did not address the impact that the requested increases in compliance time would have on airplane safety, or describe compensatory factors that would mitigate the increased exposure of the fleet to the potential unsafe condition as the result of a lengthened compliance time.

In addition, we reviewed the manufacturer's electrical power system safety assessment (which includes a failure analysis) for Boeing Model 737-600, -700, and -800 series airplanes. However, based on that review, we have determined that the safety assessment does not address all of the specific concerns that prompted the initiation of this AD.

We do agree that the compliance time may be extended based on the capability of the SCU manufacturer to perform the SCU modifications, the updated information provided by the airplane manufacturer regarding the number of SCU failures to date, the number of SCUs that have yet to receive the corrective modifications, and the rate at which the SCU manufacturer is currently able to perform the modifications.

Therefore, we have determined that the compliance time may be extended from 18 months to 36 months. We consider a 36-month compliance time will provide an acceptable level of safety, yet will allow operators sufficient time to process the remaining 514 unmodified in-service and spare SCUs through the SCU manufacturer's modification program without undue disruption of airline operations. We have revised paragraph (a) of the final rule accordingly.

Request To Revise Paragraph (a) of the NPRM

One commenter requests that the FAA remove reference to the issuance date of Chapter 49-41-61 of the AMM specified in paragraph (a) of the NPRM. The commenter notes that by specifying a particular issuance date, operators are required to use that specific revision of the AMM. The commenter states that if the specific date was removed, operators could perform the replacement of the SCU per the latest revision of Chapter 49-41-61.

We do not agree that reference to the particular issuance date of Chapter 49-41-61 should be removed. In this case, that particular date is the specific revision of the chapter that we have reviewed and determined to be an appropriate source of service information for accomplishing the replacement of the SCU of the APU. To allow operators to use future revisions of Chapter 49-41-61, either we must revise the AD to reference specific later revisions, or operators must request approval to use later revisions as an alternative method of compliance with this AD under the provisions of paragraph (b) of this AD. Since the issuance of the NPRM, we have reviewed the current revision of Chapter 49-41-61, dated October 10, 2003, and have determined that it is also an acceptable source of service information. We have revised paragraph (a) of the final rule to specify that replacing the SCU of the APU must be accomplished per a method approved by the Manager, Seattle Aircraft Certification Office (ACO), FAA. However, we have also specified that Chapter 49-41-61, dated June 5, 1998, or dated October 10, 2003, is an approved method for the accomplishment of the requirements of paragraph (a) of this final rule.

Request To Revise Paragraph (b) of the NPRM

Two commenters request that the compliance time specified in paragraph (b) of the NPRM be revised to match the compliance time specified in paragraph (a) of the NPRM for replacement of the affected SCUs. The commenters state that it is unrealistic to specify that, "as of the effective date of the AD, no person shall install on any airplane * * *," due to the turnaround time to remove, modify, and install the SCUs (discussed in comments previously).

We acknowledge that, because of a possible delay in modifying the SCUs, the compliance time of the "spares" paragraph (b) in the NPRM is unrealistic. We consider that a condition could occur where operators remove the SCUs for modification and no modified spares are available for installation, effectively, grounding the airplane. Generally, the purpose of the "spares" paragraph is to ensure that unmodified or identified "unsafe" parts are not installed/reinstalled on airplanes, and specifically, prior to the compliance time specified for modification in paragraph (a) of the final rule. Therefore, there is no reason to include a "spares" paragraph in this AD with a compliance time that is identical to the threshold compliance time required by paragraph (a) of this AD. We have determined that, in this case, removal of the prohibition to install certain SCU part numbers as of the effective date of the AD is warranted, and we have removed paragraph (b) from the final rule and reidentified subsequent paragraphs accordingly.

Request To Withdraw the NPRM

One commenter states that, given the proven service experience of the Model 737 (NG) series airplanes and the limited number of burnt harnesses (one) reported, continuing to upgrade the SCUs at the normal attrition rate will provide an adequate level of safety. We infer that the commenter is requesting that we withdraw the NPRM.

We do not agree. We consider the SCU connector failures to be a safety issue of sufficient significance to warrant the removal, modification, and replacement of the SCUs via regulatory requirement rather than by relying on passive means such as attrition. Such reliance on attrition does not ensure that the affected airplanes will receive appropriately modified SCUs in a timely manner, or at all.

Request To Revise the Airplane Flight Manual (AFM)

One commenter suggests that flight safety can be best preserved by amending the AFM to limit the number of start attempts with a consecutive fault illumination to a total of three including two restarts. The commenter states that requiring such an AFM limitation would be a more immediate action than waiting for the 18-month compliance time to replace/modify the SCUs, and would ensure

that a burning harness would not occur in flight. The commenter notes that the Non-Normal Procedures Section of the Model 737 series airplane AFM currently allows restart attempts five minutes after the APU switch is placed in the "OFF" position and the APU fault light extinguishes.

We do not agree that adding a requirement to revise the AFM is appropriate at this time. An AFM limitation might reduce the short-term likelihood of filter capacitor failures, however, the limitation would be difficult to define since the number of repetitive start attempts after which the filter capacitors have been degraded to the point of failure has not been conclusively determined. Furthermore, an AFM limitation would not address long-term exposure of the fleet to the potential unsafe condition, since the cumulative effects of non-consecutive APU restart attempts on the filter capacitors also has not been determined. No change to the final rule is necessary.

Request To Clarify the "Airworthiness Directives" Heading

One commenter, the SCU manufacturer, requests that the "Airworthiness Directives" heading be revised. The commenter suggests that the heading be revised to add the word "certain," as follows: "Airworthiness Directives; Boeing Model 737-600, -700, -700C, -800, and -900 Series Airplanes Equipped" with "Certain" Honeywell Start Converter Units." The commenter explains that adding the word "certain," clarifies that not "all" SCU part numbers are affected on the applicable airplanes.

We agree with the commenter's request and have revised the heading accordingly.

Request To Revise Wording Describing the Action To Replace

One commenter, the SCU manufacturer, requests that the wording describing the replacement of the SCU with "a new, improved SCU" be revised to read, "a modified SCU." The commenter indicates that, by specifying "a modified SCU," operators would not be misled into thinking that the SCU manufacturer would replace the existing SCU at no charge to the operators with SCUs that may be manufactured with technological advances over and above the SCUs specified in the NPRM.

We understand the commenter's position and agree that clarification is necessary. Since certain "new" production SCU part numbers incorporate design features that preclude the unsafe condition, we consider those "new" SCU part numbers to be acceptable replacements, and the table titled "SCU Part Numbers" of the final rule identifies the SCU part numbers that are acceptable as replacements. Therefore, we have revised the "Summary" section of the final rule to specify that replacement shall be with "a new or modified SCU." Since the wording specified in the "Supplementary Information" section of the NPRM that discussed replacement with "a new, improved SCU" does not reappear in the final rule, it is not necessary to revise the final rule further in this regard.

Request To Revise the "Discussion" Section of the NPRM

One commenter, the SCU manufacturer, requests that the "Discussion" section of the NPRM be revised to specify the number of incidents and APU operating hours. The commenter suggests that the FAA state that there have been six reported incidents of SCU ARINC connector overheating in approximately 5 million APU operating hours (to September 6, 2002), and that two of these events showed visual damage to adjacent electrical wire bundles on certain Boeing Model 737-700 and -800 series airplanes. The commenter states that such revision of the "Discussion" section is necessary to minimize the possibility of misunderstanding the scope of the issue.

We do not agree that the "Discussion" section of the NPRM should be revised. We acknowledge that the number of incidents of SCU connector failure that resulted in the APU generator failures might provide additional useful background information. However, we note that we have recently received updated information from the airplane manufacturer regarding additional SCU connector failure events. In fact, as of October 3, 2003, the total number of SCU connector failure events had risen from six (as reported by the commenter) to ten. The number of events in which heat damage propagated to electrical wiring external to the SCU also increased from two to three. As discussed

previously, the "Discussion" section does not reappear in the final rule. Therefore, no change to the final rule is necessary in this regard.

Request To Add a Note to "Discussion" Section

The same commenter, the SCU manufacturer, requests that a note be added at the end of the "Discussion" section of the NPRM to specify that during the investigation it was recognized that the extent of heat damage resulting from the event is proportional to the number of restarting attempts performed with an already failed unit. The commenter advises that Honeywell Service Information Letter (SIL) SIL 49-C-139 was issued to instruct the operator to recognize the fault indication and cease further starting attempts until troubleshooting can be performed. The commenter also states that events that occurred after the issue of SIL (2 events) were of reduced severity, and no damage to aircraft wiring was recorded. The commenter contends that observing the procedures described in the SIL effectively limits the extent of overheating damage.

We do not agree that the "Discussion" section of the NPRM should be revised per the commenter. No data has been submitted to the FAA to support the statement that the extent of heat damage resulting from an event is proportional to the number of restart attempts with an already failed unit. We do acknowledge, however, potential safety benefits of recognizing SCU failure indications in conjunction with terminating subsequent APU start attempts until appropriate maintenance and troubleshooting has been performed, as recommended in the above referenced Honeywell SIL. We consider that implementation of the procedures described in the Honeywell SIL until replacement of the SCUs may reduce the likelihood of SCU connector failures during the compliance period. As discussed previously, the "Discussion" section does not reappear in the final rule. Therefore, no change is necessary to the final rule in this regard.

Request To Revise Estimated Number of Affected Airplanes

One commenter, the SCU manufacturer, requests that the estimated number of airplanes currently affected by the NPRM be revised. The commenter states that it has completed modification of 198 SCU units since it submitted the original estimate of affected airplanes.

We agree that the estimated number of affected airplanes can be reduced. We also received updated information from the airplane manufacturer that confirmed a reduction of the number of affected airplanes. Therefore, we have revised the Cost Impact section of the final rule accordingly. See "Editorial Change to Labor Rate Estimate" paragraph below for other changes to the Cost Impact paragraph of this final rule.

Request To Revise SCU Part Numbers Specified in Paragraph (a) of the NPRM

One commenter, the SCU manufacturer, requests that the second column of the table in paragraph (a) of the NPRM be removed and replaced with certain other "acceptable" replacement part numbers. The commenter states that the table in paragraph (a) of the NPRM could be misleading by indicating that affected part numbers can only be replaced with the corresponding number in the right column. The commenter further states that listing the acceptable part numbers separately would clarify the requirement and indicate all acceptable SCU part numbers that may be installed on the airplane.

We agree that clarification is necessary. Based on information received from the airplane manufacturer, we have determined that SCUs having part numbers 1151858-241 (of any series) are not interchangeable with SCUs having part numbers 1152426-245 (of any series) or 1152466-250 (of any series). However, all SCUs having part numbers 1152426-245 and 1152466-250 of any series are interchangeable. Therefore, to prevent confusion regarding the selection of appropriate replacement SCUs, the table in paragraph (a) of the final rule has been revised to illustrate this clarification.

Conclusion

After careful review of the available data, including the comments noted above, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes previously described. The FAA has determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Changes to 14 CFR Part 39/Effect on the AD

On July 10, 2002, the FAA issued a new version of 14 CFR part 39 (67 FR 47997, July 22, 2002), which governs the FAA's airworthiness directives system. The regulation now includes material that relates to altered products, special flight permits, and alternative methods of compliance. However, for clarity and consistency in this final rule, we have retained the language of the NPRM regarding that material.

Editorial Change to Labor Rate Estimate

After the NPRM was issued, we reviewed the figures we use to calculate the labor rate to do the required actions. To account for various inflationary costs in the airline industry, we find it appropriate to increase the labor rate used in these calculations from \$60 per work hour to \$65 per work hour. The economic impact information, below, has been revised to reflect this increase in the specified hourly labor rate.

Cost Impact

There are approximately 403 airplanes of the affected design in the worldwide fleet. The FAA estimates that 250 airplanes of U.S. registry will be affected by this AD, that it will take approximately 4 work hours per airplane to accomplish the required actions, and that the average labor rate is \$65 per work hour. Required parts will be provided by the parts manufacturer at no cost to operators. Based on these figures, the cost impact of the AD on U.S. operators is estimated to be \$65,000, or \$260 per airplane.

The cost impact figure discussed above is based on assumptions that no operator has yet accomplished any of the requirements of this AD action, and that no operator would accomplish those actions in the future if this AD were not adopted. The cost impact figures discussed in AD rulemaking actions represent only the time necessary to perform the specific actions actually required by the AD. These figures typically do not include incidental costs, such as the time required to gain access and close up, planning time, or time necessitated by other administrative actions.

Regulatory Impact

The regulations adopted herein 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. Therefore, it is determined that this final rule does not have federalism implications under Executive Order 13132.

For the reasons discussed above, I certify that this action (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. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it may be obtained from the Rules Docket at the location provided under the caption ADDRESSES.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (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. Section 39.13 is amended by adding the following new airworthiness directive:

AIRWORTHINESS DIRECTIVE

Aircraft Certification Service
Washington, DC



U.S. Department
of Transportation
**Federal Aviation
Administration**

We post ADs on the internet at "www.faa.gov"

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

2004-10-10 Boeing: Amendment 39-13640. Docket 2001-NM-291-AD.

Applicability: Model 737-600, -700, -700C, -800, and -900 series airplanes; certificated in any category; equipped with start converter units (SCUs) having Honeywell part number (P/N) 1151858-241, Series 1 through 9 inclusive, or P/N 1152426-245, Series 1 through 6 inclusive.

Note 1: This AD applies to each airplane identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For airplanes that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (b) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated, unless accomplished previously.

To prevent overheating of the electrical connector of the SCU, which could create an ignition source and possible fire in the electrical and electronics (E/E) compartment and cause damage to certain electrical wire bundles on the E2-2 shelf, accomplish the following:

Replacement

(a) Within 36 months after the effective date of this AD: Replace the SCU of the auxiliary power unit located in the E/E compartment per a method approved by the Manager, Seattle Aircraft Certification Office (ACO), FAA. Boeing 737-600/700/800/900 Maintenance Manual, Chapter 49-41-61, dated June 5, 1998; and Aircraft Maintenance Manual, Chapter 49-41-61, dated October 10, 2003, are approved methods of compliance with the requirements of this paragraph. Replace the applicable SCU listed in the "Existing Honeywell P/N" column below, with the corresponding SCU listed in the "Replacement Honeywell P/N" column below, as follows:

SCU Part Numbers

Existing Honeywell P/N	Replacement Honeywell P/N
1151858-241, of any series 1 through 9 inclusive	1151858-241, series 10 or 1151858-241, series 11 or 1151858-241, series 12.
1152426-245, of any series 1 through 6 inclusive	1152426-245, series 7 or 1152426-245, series 8 or 1152466-250, series 1 or 1152466-250, series 2 or 1152466-250, series 3.

Alternative Methods of Compliance

(b) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Seattle ACO, FAA. Operators shall submit their requests through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, Seattle ACO.

Note 2: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Seattle ACO.

Special Flight Permits

(c) Special flight permits may be issued in accordance with § 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the airplane to a location where the requirements of this AD can be accomplished.

Effective Date

(d) This amendment becomes effective on June 24, 2004.

Issued in Renton, Washington, on May 10, 2004.

Kalene C. Yanamura,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 04-11287 Filed 5-19-04; 8:45 am]

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