

protection special condition is shown with either paragraphs 1 or 2 below:

1. A minimum threat of 100 volts per meter peak electric field strength from 10 KHz to 18 GHz.

a. The threat must be applied to the system elements and their associated wiring harnesses without the benefit of airframe shielding.

b. Demonstration of this level of protection is established through system tests and analysis.

2. A threat external to the airframe of the following field strengths for the frequency ranges indicated.

Frequency	Peak (V/M)	Average (V/M)
10 KHz–100 KHz ..	50	50
100 KHz–500 KHz	60	60
500 KHz–2 MHz	70	70
2 MHz–30 MHz	200	200
30 MHz–100 MHz .	30	30
100 MHz–200 MHz	150	33
200 MHz–400 MHz	70	70
400 MHz–700 MHz	4,020	935
700 MHz–1 GHz ...	1,700	170
1 GHz–2 GHz	5,000	990
2 GHz–4 GHz	6,680	840
4 GHz–6 GHz	6,850	310
6 GHz–8 GHz	3,600	670
8 GHz–12 GHz	3,500	1,270
12 GHz–18 GHz ...	3,500	360
18 GHz–40 GHz ...	2,100	750

As discussed above, these special conditions are applicable to the IAI Model Galaxy. Should IAI apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, the special conditions would apply to that model as well, under the provisions of § 21.101(a)(1).

Discussion of Comments

Notice of proposed special conditions No. SC-95-6-NM for the IAI Model Galaxy airplanes was published in the Federal Register on October 30, 1995 (60 FR 55221). No comments were received, and the special conditions are adopted as proposed.

Conclusion

This action affects certain design features only on the IAI Galaxy airplane. It is not a rule of general applicability and affects only the manufacturer who applied to the FAA for approval of these features on the airplane.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and record keeping requirements.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for the IAI Model Galaxy airplanes.

1. *Protection from Unwanted Effects of High-Intensity Radiated Fields (HIRF)*. Each electrical and electronic system that performs critical functions must be designed and installed to ensure that the operation and operational capability of these systems to perform critical functions are not adversely affected when the airplane is exposed to high-intensity radiated fields.

2. For the purpose of these special conditions, the following definition applies:

Critical Functions. Functions whose failure would contribute to or cause a failure condition that would prevent the continued safe flight and landing of the airplane.

Issued in Renton, Washington, on March 25, 1996.

Darrell M. Pederson,

Acting Manager, Transport Airplane Directorate Aircraft Certification Service, ANM-100.

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14 CFR Part 39

[Docket No. 94-NM-140-AD; Amendment 39-9558; AD 96-07-09]

Airworthiness Directives; Boeing Model 747-400, 757, and 767 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), applicable to Boeing Model 747-400, 757, and 767 series airplanes, that requires a revision to the Airplane Flight Manual that advises flight crews to monitor the engine indication and crew alerting system (EICAS) for "status" level messages pertaining to impending engine fuel filter bypass. This amendment also requires the installation of upgraded EICAS computers that provide "advisory" level messages to indicate such bypass conditions. This amendment is prompted by a finding that EICAS computers currently installed on these airplanes do not provide an appropriate indication to the flight crew of an impending engine fuel filter bypass

condition. The actions specified by this AD are intended to ensure that the flight crew is appropriately aware of conditions involving a severely contaminated airplane fuel system and the associated increased potential for engine power loss.

EFFECTIVE DATE: May 3, 1996.

ADDRESSES: Information related to this action may be examined at the Federal Aviation Administration (FAA), Transport Airplane Directorate, Rules Docket No. 94-NM-140-AD, 1601 Lind Avenue, SW., Renton, Washington.

FOR FURTHER INFORMATION CONTACT: G. Michael Collins, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington; telephone (206) 227-2689; fax (206) 227-1181.

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 Boeing Model 747-400, 757, and 767 series airplanes was published in the Federal Register on May 24, 1995 (60 FR 27446). That action proposed to require a revision to the FAA-approved Airplane Flight Manual (AFM) that would advise flight crews to monitor the engine indication and crew alerting system (EICAS) for "status" level messages pertaining to impending engine fuel filter bypass. That action also proposed to require the installation of upgraded EICAS computers that provide "advisory" level messages to indicate such bypass conditions.

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

Support for the Proposal

One commenter supports the proposed rule.

Request To Withdraw the Proposal: Addressed Unsafe Condition Is Extremely Remote

One commenter requests that the FAA define "unsafe condition" as required by part 39 ("Airworthiness directives") of the Federal Aviation Regulations (FAR) (14 CFR 39), and discern whether a condition is unsafe if its occurrence is "extremely remote." This commenter points out that data previously presented to the FAA demonstrate that the risk of solid particulate contaminated fuel in excess of that already addressed during engine certification is "less than 1×10^8 [sic]," making such contamination an "extremely remote [sic]" event. This

commenter asserts that, if the risk of gross fuel contamination is considered extremely remote, then it does not matter that the flight crew be made aware of such contamination, since the possibility that gross contamination will occur does not warrant that a status level message on the EICAS system be active. Since part 25.1305(c)(6) ("Powerplant instruments") of the FAR requires only that a fuel filter bypass warning be installed, the present indication system satisfies the certification standards.

This commenter states that if the occurrence of an event is "extremely remote" or less, then the demonstration of an unsafe condition required by part 39 has not been achieved for this AD action. Any FAA determination on what is unsafe should not extend beyond the type certification requirements. This commenter considers that the FAA's adoption of risk assessment methodology is critical to place the relative risks addressed in the proposed AD to proper perspective.

The FAA does not concur with the commenter. According to section 39.1 of the FAR (14 CFR 39.1), the issuance of an AD is based on the finding that an unsafe condition exists or is likely to develop in aircraft of a particular type design. That section of the FAR does not specify that an unsafe condition is considered unsafe, or a condition is "likely to develop," only if it meets a specific reliability standard, such as suggested by the commenter. Further, the criteria of the probability of an occurrence being "extremely remote (improbable)," as described in section 25.1309 ("Equipment, systems, and installations") of the FAR (14 CFR 25.1309), is on the order of 1×10^{-9} . Thus, it is a condition that is not expected to result in any occurrences during the life of the affected fleet. The FAA points out, however, that there have been several recent incidents of fuel contamination on transport category airplanes that caused the blockage of one or more engine fuel filters. Because of the awareness provided to the flight crew by the cockpit indication of the impending filter bypass, the flight crew was able to land the airplanes safely at the nearest airport. These recent events demonstrate that (1) the risk of the addressed unsafe condition is much greater than "extremely remote;" and (2) the impending fuel filter bypass message will provide the flight crew with timely indication and awareness before any engine's fuel filter is clogged to the point that the contaminated fuel bypasses the filter and causes operational problems with the engine(s).

Further, as explained in detail in the preamble to the proposal, relevant service data has led the FAA to determine that the current use of a "status" level message to indicate an impending engine fuel filter bypass creates an unsafe condition, since such messages do not provide information to the flight crew at an appropriate level of awareness to enable them to take immediate action to correct the condition. Using a "status" level message to indicate an impending engine fuel filter bypass condition could result in the flight crew being unaware of a severely contaminated airplane fuel system and the associated increased potential for engine power loss. It is this condition that the FAA considers to be unsafe for, if it is not corrected, it could result in the airplane landing with reduced engine power, or the total loss of engine power before the airplane is able to reach a suitable landing site.

Request To Withdraw the Proposal: No Documented Occurrences of the Unsafe Condition

Several commenters contend that there have been no documented in-service events to justify the proposed AD. These commenters state that historical jet transport safety records disclose that no accident has occurred that was related to solid particulate contaminated fuel from the period of 1959 through 1993, which involved over 230 million aircraft flights. These commenters point out that, although there have been numerous occurrences of annunciation to the flight crew of impending fuel filter bypass, none of the affected fleet has ever experienced loss of thrust or interruption of power subsequent to a fuel filter bypass indication. In fact, the opposite situation has occurred several times: engine power was lost due to contaminated fuel, but there was no indication of an impending fuel filter bypass annunciated to the crew. The manufacturer also describes 7 events that occurred on the affected fleet where permanent loss of thrust greater than one propulsion system occurred; although 5 of these events were a result of water contamination and the other 2 were associated with contamination of the engine vane and bleed control system on a specific engine type, none of the 7 events were annunciated to the flight crew by an impending fuel filter bypass indication. These commenters assert that lack of substantiation for the FAA's position that an unsafe condition exists is reason to withdraw the proposal.

The FAA does not concur. Although there have been no reported cases of

loss of thrust or interruption of power subsequent to a fuel filter bypass indication, the potential for this unsafe condition exists as long as the potential for contaminated fuel exists. This AD action addresses that potential unsafe condition.

As stated earlier, there have been several recent incidents of fuel contamination on transport category airplanes that caused the blockage of one or more engine fuel filters. The flight crews of the incident airplanes were made aware of this condition by the cockpit indication of the impending filter bypass and, in each case, were able to land the airplanes safely. These recent events demonstrate that the impending fuel filter bypass message should provide the flight crew with timely indication and awareness before any engine's fuel filter is clogged to the point that the contaminated fuel bypasses the filter and causes operational problems with the engine(s). The FAA maintains that early recognition of an impending fuel filter bypass will reduce the potential hazards associated with subsequent power loss and engine shutdowns.

Request To Withdraw the Proposal: Maintenance Practices Should Be Followed Properly

Several commenters indicate that the unsafe condition could be better addressed by improving maintenance practices relevant to the fuel system, rather than by requiring the proposed EICAS upgrade. These commenters state that "gross contamination" of the fuel to the levels discussed in the notice can only result from long-term negligence and disregard of standard servicing and maintenance practices. These commenters contend that appropriate maintenance programs relative to airplane fuel systems are required by the FAR: namely, parts 121.135(b)(18) ("Maintenance manual requirements—contents") and 121.1369(b) ("Manual requirements") [14 CFR 121.135(b)(18) and 21.1369(b)]. To meet the requirements of these regulations, maintenance programs must entail controls and refueling procedures, including sampling prior to fueling, to ensure that fueling processes will be safe and clean. Therefore, if maintenance programs are followed correctly, there is ample assurance that the possibility of contamination of the fuel system will be prevented. Finally, these commenters point out that ensuring that proper aircraft fuel servicing and storage methods are followed would be far more economical to operators than installing the proposed EICAS modification.

The FAA does not concur. Service experience has demonstrated that, despite regulations that mandate the proper maintenance of fuel systems, fuel contamination in airplane fuel systems continues to occur. In fact, subsequent to the issuance of the notice, the FAA was advised of three recent incidents of fuel system contamination on transport category airplanes. In these incidents, the engine fuel filter bypass indication system alerted the flight crew that impending fuel filter bypass conditions were present on one or more engines:

1. The first of these incidents occurred during the climb phase of flight. At that time, the crew elected to return to the departure airport. During the approach to that airport, the other engine's fuel filter bypass annunciation light illuminated.

2. The second incident occurred three hours after the airplane had departed the airport. At that time, the fuel filter bypass annunciation light illuminated on one engine. Following this indication, and during the airplane's descent to the destination airport, the other engine's fuel filter bypass annunciation light illuminated.

3. In the third incident, at approximately four hours into the flight, a fuel filter bypass alert occurred on each of the airplane's three engines.

Investigation into all three of these events revealed that apparently the contamination of the airplanes' fuel systems was the result of malfunctions of the fuel hydrant system installed at a particular airport where these airplanes took on fuel.

By citing these recent incidents, which demonstrate the need for flight crew awareness of impending engine fuel filter bypass, the FAA emphasizes that it is likely events of fuel system contamination will occur in the future, despite the industry's efforts to maintain a "clean" fuel supply.

Fuel contamination can affect the operation of all engines on an airplane. Section 25.1305(c)(6) of the FAR [14 CFR 25.1305(c)(6)] requires an indication to alert the flight crew that an engine's fuel filter is contaminated before the filter is clogged to the point that the fuel bypasses the filter(s) and allows the contamination to pass to the engine(s). A separate indication is required for each engine's fuel filter. The purpose of these requirements is to provide the flight crew with an indication that the fuel is contaminated before the contamination causes flameout or operational anomalies of one engine or multiple engines. This indication of impending engine fuel filter bypass provides the flight crew with important information when they

still have an opportunity to consider action such as diverting to an alternative airport.

Request To Withdraw the Proposal: Distraction of Flight Crew by Alert Messages

Several commenters contend that the proposed "interim" action requiring the flight crew to check the EICAS status page, and the proposed final action of modifying the EICAS computer to display the fuel filter bypass message as an "advisory" level message, will result in the confusion and distraction of the flight crew. These commenters point out that flight crews are trained to check the "status" message display before engine start; therefore, checking the "status" message display during flight contradicts their basic operational practices and likely will cause them confusion. Additionally, the flight crew could be distracted by other "status" level messages that may occur during a flight.

Another commenter indicates that the reliability of the sensor switch for the fuel filter bypass indication is rated at 1×10^{-4} . From this reliability standpoint, it is obvious that "nuisance warnings" (that is, indications of a fuel filter bypass condition when one does not actually exist) will occur more frequently than will an actual gross fuel contamination event (which has a 1×10^{-8} probability). In light of this, the commenter considers that the proposed rule should address the safety concerns that will be created by the flight crew's response to what may amount to "nuisance" messages. This commenter and several others believe that safety will be reduced when flight crews are tasked to respond to such false indications by (1) making unnecessary flight diversions, (2) landing at airports that they are not familiar with; and (3) shutting down engines needlessly.

The FAA does not concur with the commenters' suggestion that the requirements of this AD will result in unnecessary distractions or confusion of the flight crew.

"Status" level messages do not provide immediate crew awareness; the only sign given to the crew regarding "status" level information is the appearance of the word "STATUS" on the EICAS screen. Under ordinary circumstances, in order to find out the nature of a "status" level message, the flight crew has to take action to review the status. Such a review normally is done when practical, based on the activity level in the flight deck; in general, it is not done during flight.

"Advisory" level messages, on the other hand, are brought to the flight

crew's attention by the appearance of the complete message on the EICAS screen (e.g., the message "R ENG FUEL FILT" appears on the existing EICAS screen of Model 767 series airplanes that are powered by Pratt & Whitney JT9D engines). No additional action must be taken by the flight crew in order to find out the nature of "advisory" alerts.

For the reasons discussed in detail in the proposal, the FAA finds that an "advisory" level message is the appropriate level for alerting the flight crew to an impending fuel filter bypass condition. The requirement of this AD for the flight crew to respond to EICAS "status" level indications relative to an engine fuel filter bypass message (by first checking the status page) is consistent with the level of response required for an "advisory" level message. In support of the FAA's position on this issue, two operators commented that their crews are already trained to check the status page whenever the status cue appears.

The FAA also does not concur with the commenters' suggestion that the display of the fuel filter bypass message as an "advisory" level message will cause a reduction in safety. On the contrary, an "advisory" level message appears on the upper EICAS display, providing the flight crew with an immediate awareness of the impending bypass condition, without the need to look up any status page to obtain the relevant information necessary for reaction.

With regard to the possibility that flight crews would divert to an alternative airport because of false indications of impending fuel filter bypass, the FAA considers that, if false indications are occurring frequently, then the reliability of the indication system should be improved. However, other than the reliability level presented by the commenter, no other data has been presented to the FAA to indicate that the indication system is not reliable. In fact, one operator commented that, because the fuel filter bypass system on its fleet has a good reliability record, the proposed rule would not have an operational impact on the affected fleet.

The FAA does acknowledge the commenters' concern, however, that flight crews could divert to alternate airports because of an increased awareness of other status level messages that may be displayed. To address this, the FAA has revised paragraphs (a) and (b) of the final rule to include the following sentence in the text that is to be added to the Airplane Flight Manual (as interim action):

"If other status level messages are displayed, the flight crew may deal with them in accordance with the appropriate operator procedure."

Request To Withdraw the Proposal: Current Level of Message Indication Is Adequate

Several commenters assert that the proposed rule is not necessary because the current flight crew indication system is adequate. The flight crew is made aware of fuel filter problems via the "status" message system of the EICAS, which they must check prior to dispatch of the airplane. The current "status" level message gives adequate indication to the flight crew of an impending fuel filter bypass; from this message, the flight crew can determine what action is required prior to dispatch. Further, these commenters point out that the Master Minimum Equipment List (MMEL) does not permit dispatch with an "engine fuel filter" message indicated.

The FAA does not concur with these commenters. The original design and operational philosophy of the EICAS on the affected airplanes is that "status" level messages are to be reviewed by the flight crew only prior to dispatch of the airplane. The FAA now considers that this is not adequate for two reasons:

1. It does not meet the need for immediate crew awareness of an impending fuel filter bypass during flight. The crew would not be alerted to the fact that an engine fuel filter had become blocked during a flight until the operation of one or more engines was affected. This could result in the flameout of one or all engines.

2. The operational requirements under part 121 of the FAR permit more than one flight under one "airplane dispatch." This could result in operating an airplane for several flights without checking for "status" level messages. In such cases, a message indicating an impending fuel filter bypass could go unnoticed by the flight crew for several flights.

Request To Withdraw the Proposal: Unsafe Condition Is Actually Water in the Fuel

Two commenters state that the principal source of fuel contamination in the affected airplanes is from water in the fuel and the consequent formation of ice particles across the fuel filter due to the sub-zero temperatures that occur during flight. These commenters contend that there are either procedures or systems already in place that effectively control this and thereby eliminate any associated unsafe condition.

These commenters believe that the original reason for providing flight crews with immediate indication of an impending engine fuel filter bypass was to prompt them to activate the fuel heating system. Some of the aircraft that would be affected by the proposed AD incorporate a manual fuel heat system designed to increase the temperature of the fuel upstream of the fuel filter to avoid blockage of the filter due to ice accumulation. The fuel heat system servo valve is activated by an electrical switch; and the fuel filter system contains a differential pressure switch that sends a signal to lights on the flight deck that indicate an impending fuel filter bypass condition. The flight crew procedure for responding to this illumination of the light is to activate the fuel heat system. These procedures are to ensure that fuel heat is applied to the engine fuel system to eliminate any blockage due to icing. Other aircraft affected by the proposed AD have continuous fuel heating, which requires no flight crew action or immediate indication. In light of this, the commenters consider that no AD action is necessary.

The FAA does not concur. The original intent of indicating an impending fuel filter bypass condition was to indicate clogging of the fuel filter due to fuel contamination, not merely ice formation. While it is true that the FAA has accepted the inclusion of a procedure in the AFM for certain airplanes to prompt the flight crew to activate the fuel heating system when the fuel filter bypass indication is annunciated, this was not the original, nor only, intent for the indication. [This has been confirmed by a review of the docket file for the amendment to part 25 that established FAR 25.1305(c).]

Request To Withdraw the Proposal: "Gross Contamination" Is an Undefined Concern

Several commenters request that the FAA define "gross contamination" of fuel and determine its physical and chemical properties. These commenters state that gross contamination has not been defined and documentation of it has not been provided to substantiate its existence. They consider it unrealistic and inappropriate for the FAA to mandate protection against a condition that has not been technically defined. One of these commenters points to the description offered by the FAA in the preamble to the proposal and states that fuel system contamination of the particulate size and concentration described by the FAA would likely cause damage and/or blockage to other fuel system components and reduce fuel

flow without ever causing an impending fuel filter bypass indication.

Other commenters argue that section 33.67 ("Airworthiness standards—Fuel system") of the FAR (14 CFR 33.67) allows for continued operation of the aircraft with the maximum contamination rate (specified in the FAR) for a period of time that exceeds the typical maximum flight leg of the aircraft before the fuel filter bypass valve opens. Based on this current certification design standard, the commenters consider that the capacity of the filters currently installed on the affected airplane is sufficient to allow the airplane to continue to the destination airport following an impending bypass indication.

The FAA responds to these comments by pointing out that part 25.997 ("Fuel filter or strainer") specifies that fuel filters must:

"* * * Have the capacity (with respect to operating limitations established for the engine) to ensure that engine fuel system functioning is not impaired, with the fuel contaminated to a degree (with respect to particle size and density) that is greater than that established for the engine in part 33 [of the FAR]."

"Gross contamination" is defined in the context of this AD action to include levels of fuel contamination that are greater than those established for the engine in part 33 of the FAR. Examples of such contamination that actually have been found in service include microbial growth, sealant, lint, metal particles, fuel tank cleaning chemicals, paper towels, rags, and liquid fertilizer. There also have been data indicating the existence of other contaminants in the fuel system that, although unidentified, were severe enough to cause engine power loss. The numerous reports of in-service incidents associated with gross fuel contamination demonstrate that, despite the many industry standards intended to maintain cleanliness of the airplane fuel supply, contamination of airplane fuel systems will likely occur in the future. In anticipation of this likelihood, the FAA considers that an immediate indication of impending engine fuel filter bypass will provide the flight crew with the appropriate information required to take action before contamination of the fuel system becomes a source of engine operational problems.

Requests To Change the AFM Revision Requirement

One commenter requests that the proposed AFM revision be changed to allow the flight crew the option of continuing the flight to the original destination, without diverting, if the

"ENG FUEL FILT" message illuminates during flight and no other engine parameter fluctuations (i.e., low fuel flow, low fuel pressure, rotor speed deterioration, etc.) are evident. The commenter considers this change in the wording to be necessary in order to decrease the possibility of confusion on the part of the flight crew should a nuisance message occur (that is, the message actually is false) and the flight crew risks diverting to an unfamiliar airport.

The FAA does not agree that a change to the AFM revision is necessary. As worded in the AD, the text of the AFM revision does not instruct the flight crew to land at the nearest airport. The AFM revision provides information to the flight crew to indicate that, if more than one engine's fuel filter message is displayed, the airplane fuel system may be contaminated and erratic engine operation or engine flame out may occur. This addresses the possibility of a false indication on one engine fuel filter. The wording of the AFM revision addresses only the situation where there are engine fuel filter messages for more than one engine's fuel filter, and it leaves the decision on any flight crew action, including diverting to an alternative airport, up to the flight crew.

One operator requests that paragraphs (a) and (b) of the proposal be revised to include the AFM revision regarding "advisory" level messages that is currently contained in proposed paragraph (d)(2); and that proposed paragraph (d)(2) subsequently be deleted. Proposed paragraphs (a) and (b) would require an AFM revision relative to status level messages. Paragraph (d)(2) then would require that, concurrent with the installation of the upgraded EICAS, operators are to remove the AFM revision required by paragraphs (a) and (b), and to insert a new AFM revision pertaining to advisory level messages. This operator has an AFM assigned to each aircraft in its fleet, and believes that it would be nearly impossible to ensure that the [(paragraph (d)(2))] AFM revision gets incorporated concurrently with the installation of the upgraded EICAS computer, since the upgrade could occur at any time on the flight line. This operator requests that the proposed AD be revised so that only one AFM revision would be necessary.

The FAA does not concur. The FAA considers that incorporating both of the proposed AFM revisions at the same time in the same location in the AFM could cause undue confusion for the flight crew. For example, on an airplane having the upgraded EICAS computer, if an "advisory" level ENG FUEL FILT

message appeared on the EICAS display during flight, and then later the status cue appeared, the flight crew would look for a "status" level ENG FUEL FILT message on the EICAS status page. No "status" level message would be displayed because the EICAS computer had been updated to display that message only as an "advisory" level message. This could lead the flight crew to distrust the "advisory" level message because of the absence of a "status" level message. However, if the upgrade of the EICAS computer were eventually developed so that it can be accomplished using a method that incorporates both the "status" level message and the "advisory" level message in the modified computer, and if either level message can be selected after the computer is installed (i.e., pin selectable), then operators could modify their entire fleet and change the message level and AFM wording across their fleet at the same time. This capability depends on the method that is finally developed by the manufacturer to incorporate the upgrade of the EICAS computers. The FAA acknowledges that there may be other situations and other methods that could be used to achieve the intent of this portion of the AD. For these cases, paragraph (e) of the final rule provides operators the opportunity to request the use of alternative methods of compliance.

Requests To Extend the Compliance Time for Modification

Several commenters request that paragraph (d) of the proposed rule be revised to extend the compliance time for the modification from the proposed 4 years to as much as 6 years. These commenters state that it will take approximately 2 years for Boeing and the EICAS computer manufacturer to define, develop, and release the modified software necessary to accomplish the change in message level. Some commenters point out that certain older model EICAS computers will also require additional hardware modifications before the required modification can be installed. One operator is concerned that the modification for the Model 757 will not be available until after the modifications for the Model 747-400 and 767 are released.

These commenters state that, once the modification is available, they will require a minimum of an additional 18 months to modify all of the affected airplanes in their fleets. Further, the proposed compliance time will likely require that the modification be installed during special shop visits, instead of during regularly scheduled

maintenance. This would impose an undue financial burden on operators, and disproportionate manpower constraints on maintenance facilities.

The FAA does not concur with the commenters' request. In developing an appropriate compliance time, the FAA considered not only the safety implications, but the time necessary for design of an acceptable modification, and normal maintenance schedules for timely accomplishment of the modification. In light of all of these items, as well as discussions with the manufacturer, the FAA finds that 4 years provides an acceptable level of safety, and provides sufficient time to produce the modification as well as install it on the affected fleet during regular maintenance intervals. However, paragraph (e) of the final rule does provide affected operators the opportunity to apply for an adjustment of the compliance time if data are presented to justify such an adjustment.

Request To Delete the Requirement for Modification

One commenter concurs with the proposed "interim" requirement to revise the AFM to advise the flight crew to respond to the "status" level messages. However, this commenter requests that the proposed requirement for the modification (upgrade) of the EICAS computer be deleted because an acceptable modification has not yet been designed and made available. The commenter suggests that the FAA postpone action on that specific requirement until the modification is developed and an adequate cost analysis of it can be made.

The FAA does not concur that delaying this AD is warranted. The FAA maintains that sufficient technology and data exist to enable the manufacturer(s) to devise, and operators to install, the EICAS upgrade within the compliance time provided by the AD. Further, the FAA has determined that an EICAS upgrade (and accompanying AFM revision) to provide "advisory" level messages of an impending engine fuel filter bypass condition is the most effective way to positively address the unsafe condition that is the subject of this AD. The FAA considers that long-term continued operational safety will be better assured by this design change rather than by only implementing the "interim" action of revising the AFM to advise the flight crew to respond to the "status" level messages.

Request To Allow Dispatch With an Inoperative EICAS

Several commenters request that the proposed AD be revised to include a

provision to allow dispatch of the airplane with an inoperative EICAS computer. These commenters point out that the MMEL for the affected airplanes currently allows dispatch with one EICAS computer removed or inoperative for one calendar day. An inoperative or removed EICAS computer would preclude the display of status messages during that time, which would be contrary to the requirements of the proposed AD. These commenters are concerned that dispatch capability under the MMEL will be reduced or restricted as a result of the proposed AD, and this would have an extensive operational impact on affected operators. The commenters believe that the risk of a gross fuel contamination event is so low that the current MMEL dispatch relief should be continued even though an "ENG FUEL FILT" status message is not available.

The FAA does not concur with the commenters' request. The use of the status message as a method of providing the flight crew with indication of an impending fuel filter bypass precludes dispatch with an inoperative EICAS computer. Dispatching an airplane configured so that the flight crew does not have the ability to check the "ENG FUEL FILT" status display messages only exacerbates the unsafe condition addressed by this AD. In order to ensure and maintain the ability of the flight crew to check these messages during flight, the status display must be operational. After the EICAS computers have been modified to provide "advisory" level messages to the flight crew to indicate an impending fuel filter bypass condition, dispatch with an inoperative EICAS computer will again be permitted under the existing MMEL.

Request for Additional Cost Impact Information

Several commenters consider that the cost impact information provided by the FAA in the preamble to the notice is inadequate:

1. Certain of these commenters state that preliminary estimates from industry indicate that the cost to upgrade the EICAS computers could be between \$18 and \$25 million for the affected fleet. One of these commenters requests that the adoption of the final rule be postponed to permit operators to obtain additional costs data from the manufacturer.

2. Another commenter states that the cost analysis presented in the proposal assumes that all operators will upgrade the EICAS computers to provide for global positioning system (GPS) navigation, and this will reduce the cost to accomplish the modification to

change the "engine fuel filter" message to an advisory level. The commenter contends that all operators may not incorporate GPS or other EICAS upgrades within the compliance time proposed, and the cost to an operator who elects only to change the level of the engine fuel filter message could be as much as \$100,000 per airplane.

3. One commenter states that the proposed requirement to upgrade the EICAS computer could include additional incidental costs, such as rewiring and the installation of cockpit annunciator lights. All of this could cost \$10,000 per airplane, in addition to the EICAS upgrade.

4. Another commenter states that, if the upgraded EICAS computers are not interchangeable with the non-upgraded computers, the increased cost to maintain a supply of spare EICAS computers of both configurations should be included in the cost impact of the AD.

5. One commenter requests that, prior to issuing a final rule, the FAA perform a full cost-benefit analysis of it in accordance with Executive Order 12866, and that the results of the analysis be presented in a supplemental notice of this proposed rulemaking.

The FAA acknowledges these commenters' concerns about the cost impact of this AD action.

As for the cost of the upgraded EICAS computers, the FAA has attempted to obtain definitive data to verify what the actual cost of the ultimate modification will be, but it has been unable to do so. The FAA invited commenters to provide such information, but received what can only be called "best guesses" and no verifiable cost estimates. Comments are more likely to be persuasive to the extent that they provide specific and detailed information regarding actual costs. When commenters submit simple generalizations about the costs, there is little that the FAA can consider.

The FAA did attempt to estimate the cost of the EICAS upgrade required by this AD by reviewing the average costs of similar types of previous modifications of EICAS computers (and other avionics components) installed on transport category airplanes. The labor and parts costs for other individual EICAS modifications have proven to be quite variable, ranging from 1 to 20 work hours for labor and as much as \$46,000 for parts. Because of these variables and because the manufacturers have not completed development of the EICAS upgrade, the FAA's attempt to determine a realistic cost estimate has been somewhat futile. The FAA is continuing to work with the appropriate manufacturers to establish verifiable

costs of labor and parts associated with the upgrade specifically required by this AD.

Despite the costs associated with the individual EICAS upgrade required by this AD, the FAA does expect most operators to accomplish this upgrade at the same time that they accomplish other upgrades to the EICAS systems on the affected airplanes. The FAA bases this expectation on discussions it has held with the pertinent manufacturers and a review of the history of EICAS upgrades. These have led the FAA to be confident that the cost of modifying the EICAS computers in accordance with the requirements of this AD will be shared with other upgrades to the EICAS computers that are planned to be developed and made available during the 4-year compliance time of this AD. For example, as indicated in the proposal, the addition of GPS navigation capability is one modification that is known to require modification of the EICAS computers, and this modification likely will be introduced into the entire fleet of airplanes affected by this AD within the 4-year compliance time.

In fact, the 4-year compliance time was established specifically in consideration of allowing sufficient time for operators to incorporate the EICAS upgrade required by this AD at the same time they incorporate other upgrades to EICAS that will be available. The intent of this was to enable operators to reduce the costs of fleet downtime, labor, and parts. This is not to imply that the EICAS upgrade required by this AD *must* be incorporated together with any other change to the EICAS. Rather, it means that cost-conscious operators have the opportunity of accomplishing several other modifications of the EICAS concurrently with the upgrade required by this AD, and thereby reduce their affected fleet's downtime, labor costs, and parts costs.

As for additional incidental costs that would be associated with the requirements of this AD, the FAA recognizes that, in accomplishing the requirements of any AD, operators may incur "incidental" costs in addition to the "direct" costs of the specific action required by the AD. However, the cost analysis in AD rulemaking actions typically does not include incidental costs. Because incidental costs may vary significantly from operator to operator, they are almost impossible to calculate.

As for the interchangeability of the upgraded EICAS computer with the existing computers, the FAA notes that incorporation of previous modifications of this type into the EICAS system has always provided for interchangeability with earlier upgrades. The FAA expects

that the manufacturer of the EICAS computer will design the modification for the message level change to maintain interchangeability of units.

As for the request that the FAA conduct a "full cost-benefit analysis" of the proposed AD in accordance with Executive Order 12866, the FAA points out that it is not required to do a such an analysis for each AD. In fact, AD's were explicitly exempted from the Office of Management and Budget (OMB) coordination process described in Section 6 of that Executive Order. Looking at the reasoning behind this, it is important first to realize that, as a matter of law, in order to be airworthy, an aircraft must conform to its type design and be in a condition for safe operation. The type design is approved only after the FAA makes a determination that it complies with all applicable airworthiness requirements. In adopting and maintaining those requirements, the FAA has already made the determination that they establish a level of safety that is "cost-beneficial." Second, it is important to understand that, when the FAA later makes a finding of an unsafe condition in an aircraft and issues an AD, it means that the original cost-beneficial level of safety established for that aircraft is no longer being achieved, and that the required AD actions are necessary in order to restore that level of safety. Because the original level of safety has already been determined to be cost-beneficial, and because the AD does not add an additional regulatory requirement that increases the level of safety *beyond* what has been established by the type design, a full cost-benefit analysis for each AD would be considered redundant and would be unnecessary.

In general, because AD's require specific actions to address specific unsafe conditions, they appear to impose costs that would not otherwise be borne by operators. However, because of the general obligation of operators to maintain and operate aircraft in an airworthy condition, this appearance is deceptive. Attributing those costs solely to the issuance of this AD is unrealistic because, in the interest of maintaining and operating safe aircraft, prudent operators would accomplish the required actions even if they were not required to do so by the AD. In any case, the FAA has determined that direct and incidental costs are still outweighed by the safety benefits of the AD.

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 change previously described. The FAA has determined that this change will neither increase the economic burden on any operator nor increase the scope of the AD.

Cost Impact

There are approximately 1,378 Model 747-400, 757, and 767 series airplanes of the affected design in the worldwide fleet. The FAA estimates that 588 airplanes of U.S. registry will be affected by this proposed AD.

The initial revision to the AFM will take approximately 1 work hour per airplane to accomplish, at an average labor rate of \$60 per work hour. Based on these figures, the cost impact of this action on U.S. operators is estimated to be \$35,280, or \$60 per airplane.

The FAA currently has no specific cost estimates associated with the installation of upgraded EICAS computers, since the upgrade has not been developed yet. The FAA has been advised, however, that the manufacturer is planning other changes to these EICAS computers that are necessary to provide for GPS navigation capability and other enhanced features. The compliance time of four years for the EICAS installation requirements of this AD will allow a portion of the EICAS computers installed on airplanes affected by this AD to have the required EICAS message upgrade made concurrently with those other planned EICAS changes, thereby reducing the costs and scheduling impact of such changes on operators.

The revision to the AFM that will be required subsequent to the installation of the upgraded EICAS computers will take approximately 1 work hour per airplane to accomplish, at an average labor rate of \$60 per work hour. Based on these figures, the cost impact of this action on U.S. operators is estimated to be \$35,280, or \$60 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.

Regulatory Impact

The regulations adopted herein will not have substantial direct effects 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, in accordance with Executive Order 12612,

it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

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:

96-07-09 Boeing: Amendment 39-9558.
Docket 94-NM-140-AD.

Applicability: All Model 747-400, 757, and 767 series airplanes; certificated in any category.

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 (e) 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 ensure that the flight crew is appropriately aware of conditions involving

a severely contaminated airplane fuel system and the associated increased potential for engine power loss, accomplish the following:

(a) For all Model 747-400 series airplanes: Within 60 days after the effective date of this AD, revise the Limitations Section of the FAA-approved Airplane Flight Manual (AFM) to include the following statement. This may be accomplished by inserting a copy of this AD in the AFM.

"Respond to the EICAS STATUS CUE by checking for the following status level messages(s):

ENG 1 FUEL FILT
ENG 2 FUEL FILT
ENG 3 FUEL FILT
ENG 4 FUEL FILT

If more than one of these impending fuel filter bypass messages is displayed, airplane fuel system contamination may be present, which can result in erratic engine operation and engine flameout.

If other status level messages are displayed, the flight crew may deal with them in accordance with the appropriate operator procedure."

(b) For all Model 757 series airplanes, and Model 767 series airplanes powered by General Electric CF6-80A and CF6-80C2 engines, Pratt & Whitney PW 4000 engines, and Rolls-Royce RB211-524 engines: Within 60 days after the effective date of this AD, revise the Limitations Section of the FAA-approved Airplane Flight Manual (AFM) to include the following statement. This may be accomplished by inserting a copy of this AD in the AFM.

"Respond to the EICAS STATUS CUE by checking for the following status level messages(s):—

R ENG FUEL FILT —
L ENG FUEL FILT

If more than one of these impending fuel filter bypass messages is displayed, airplane fuel system contamination may be present, which can result in erratic engine operation and engine flameout.

If other status level messages are displayed, the flight crew may deal with them in accordance with the appropriate operator procedure."

(c) For Model 767 series airplanes powered by Pratt & Whitney JT9D engines: Within 60 days after the effective date of this AD, revise the Limitations Section of the FAA-approved Airplane Flight Manual (AFM) to include the following statement. This may be accomplished by inserting a copy of this AD in the AFM.

"If both of the following EICAS advisory level messages for impending fuel filter bypass are displayed, and engine fuel icing is not suspected (based on the fuel temperature being too high or because engine fuel heat has been selected "on"), airplane fuel system contamination may be present, which can result in erratic engine operation and engine flameout:—

R ENG FUEL FILT —
L ENG FUEL FILT"

(d) For all Model 747-400 series airplanes; all Model 757 series airplanes; and Model 767 series airplanes powered by General Electric CF6-80A and CF6-80C2 engines, Pratt & Whitney PW 4000 engines, and Rolls-

Royce RB211-524 engines: Accomplish the requirements of paragraph (d)(1) and (d)(2) of this AD: —

(1) Within 4 years after the effective date of this AD, install an upgraded engine indication and crew alerting system (EICAS) computer that will provide "advisory" level messages to the flight crew to indicate an impending engine fuel filter bypass condition for each engine. The installation shall be accomplished in accordance with a method approved by the Manager, Seattle Aircraft Certification Office (ACO), FAA, Transport Airplane Directorate. —

(2) Concurrent with the installation required by paragraph (d)(1) of this AD, remove the AFM revisions required by paragraphs (a) and (b) of this AD, and revise the Limitations Section of the AFM to advise the flight crew that impending engine fuel filter bypass advisory level messages for multiple engines may indicate contamination of the airplane fuel system, which can result in erratic engine operation and engine flameout. The revision to the Limitations Section must be approved by the Manager, Seattle ACO, FAA, Transport Airplane Directorate. —

(e) 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, Transport Airplane Directorate. Operators shall submit their requests through an appropriate FAA Principal Operations 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.

(f) Special flight permits may be issued in accordance with sections 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. —

(g) This amendment becomes effective on May 3, 1996.

Issued in Renton, Washington, on March 27, 1996.

Darrell M. Pederson,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 96-7959 Filed 4-2-96; 8:45 am]

BILLING CODE 4910-13-P

Federal Highway Administration

23 CFR Part 230

[FHWA Docket No. 82-19]

RIN 2125-AB15

Equal Employment Opportunity on Federal and Federal-Aid Construction Contracts (Including Supportive Services); Report Requirements

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Final rule; technical amendments.

SUMMARY: This document amends the current regulation on recordkeeping and reporting requirements for on-the-job training on Federal-aid construction contracts which require contractors to submit Form FHWA-1409, Federal-Aid Highway Construction Contractor's Semi-Annual Training Report, and State highway agencies to complete and submit Form FHWA-1410, Federal-Aid Highway Construction Semi-Annual Training Report. This amendment eliminates these reporting requirements in order to reduce the administrative burden on contractors as well as States. Additionally, the Office of Management and Budget approval for these forms under the Paperwork Reduction Act has lapsed, and as a matter of common industry practice, compliance by construction contractors and States is not required.

EFFECTIVE DATE: May 3, 1996.

FOR FURTHER INFORMATION CONTACT:

Linda J. Brown, Chief, Policy and Program Development Division, Office of Civil Rights, 202-366-0471, or Will Baccus, Office of Chief Counsel, 202-366-1396, Federal Highway Administration, 400 Seventh Street, SW., Washington, D.C. 20590. Office hours are from 7:45 a.m. to 4:15 p.m., e.t., Monday through Friday, except Federal holidays.

SUPPLEMENTARY INFORMATION:

On November 22, 1982, the FHWA published an NPRM in the Federal Register (47 FR 52470). The rulemaking sought comments on the elimination of unnecessary and burdensome recordkeeping requirements being imposed on State highway agencies and construction contractors. The data and information received during the comment period and analysis initiated by the FHWA indicate that elimination of the reporting requirement regarding on-the-job training on Federal-aid construction contracts (23 CFR 230.121(d)(1) and (2)) would not adversely impact other areas of the equal opportunity program as these reports are not used for any related purpose e.g., contract compliance determination or compilation of any report on the status of civil rights programs.

Twenty-nine comments were submitted to the docket. State transportation agencies, contractors, contractors associations, unions, and other interested parties that commented to the docket overwhelmingly supported the elimination of these recordkeeping and reporting requirements. Also, current industry practice reflect the views of the commenters regarding the