

Frequency	Field Strength (volts per meter)	
	Peak	Average
70 MHz–100 MHz	50	50
100 MHz–200 MHz	100	100
200 MHz–400 MHz	100	100
400 MHz–700 MHz	700	50
700 MHz–1 GHz	700	100
1 GHz–2 GHz ...	2000	200
2 GHz–4 GHz ...	3000	200
4 GHz–6 GHz ...	3000	200
6 GHz–8 GHz ...	1000	200
8 GHz–12 GHz	3000	300
12 GHz–18 GHz	2000	200
18 GHz–40 GHz	600	200

The field strengths are expressed in terms of peak root-mean-square (rms) values.

or,

(2) The applicant may demonstrate by a system test and analysis that the electrical and electronic systems that perform critical functions can withstand a minimum threat of 100 volts per meter, electrical field strength, from 10 kHz to 18 GHz. When using this test to show compliance with the HIRF requirements, no credit is given for signal attenuation due to installation.

A preliminary hazard analysis must be performed by the applicant, for approval by the FAA, to identify either electrical or electronic systems that perform critical functions. The term "critical" means those functions, whose failure would contribute to, or cause, a failure condition that would prevent the continued safe flight and landing of the airplane. The systems identified by the hazard analysis that perform critical functions are candidates for the application of HIRF requirements. A system may perform both critical and non-critical functions. Primary electronic flight display systems, and their associated components, perform critical functions such as attitude, altitude, and airspeed indication. The HIRF requirements apply only to critical functions.

Compliance with HIRF requirements may be demonstrated by tests, analysis, models, similarity with existing systems, or any combination of these. Service experience alone is not acceptable since normal flight operations may not include an exposure to the HIRF environment. Reliance on a system with similar design features for redundancy as a means of protection against the effects of external HIRF is generally insufficient since all elements of a redundant system are likely to be exposed to the fields concurrently.

Applicability

As discussed above, these special conditions are applicable to Raytheon Model H90 (T-44A) airplanes. Should ARINC, Inc. apply at a later date for a supplemental type certificate to modify any other model on the same type certificate to incorporate the same novel or unusual design feature, the special conditions would apply to that model as well under the provisions of § 21.101.

Conclusion

This action affects only certain novel or unusual design features on one model of airplane. It is not a rule of general applicability and affects only the applicant who applied to the FAA for approval of these features on the airplane.

The substance of these special conditions has been subjected to the notice and comment period in several prior instances and has been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. For this reason, and because a delay would significantly affect the certification of the airplane, which is imminent, the FAA has determined that prior public notice and comment are unnecessary and impracticable, and good cause exists for adopting these special conditions upon issuance. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment described above.

List of Subjects in 14 CFR Part 23

Aircraft, Aviation safety, Signs and symbols.

Citation

■ The authority citation for these special conditions is as follows:

PART 23—[AMENDED]

Authority: 49 U.S.C. 106(g), 40113 and 44701; 14 CFR 21.16 and 21.101; and 14 CFR 11.38 and 11.19.

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 Raytheon Model 90 (T-44A) airplanes modified by ARINC, Inc. to add the Rockwell Collins Pro Line 21 Avionics System.

1. *Protection of Electrical and Electronic Systems from High Intensity Radiated Fields (HIRF)*. Each system

that performs critical functions must be designed and installed to ensure that the operations, and operational capabilities of these systems to perform critical functions, are not adversely affected when the airplane is exposed to high intensity radiated electromagnetic fields external to the airplane.

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 Kansas City, Missouri, on June 22, 2005.

John R. Colomy,

Acting Manager, Small Airplane Directorate, Aircraft Certification Service.

[FR Doc. 05-12879 Filed 6-29-05; 8:45 am]

BILLING CODE 4910-13-P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 23

[Docket No. 228, Special Condition 23-167-SC]

Special Conditions; Diamond Aircraft Industries, EFIS and Full Authority Digital Engine Control (FADEC) on the Diamond DA-42; Protection of Systems for High Intensity Radiated Fields (HIRF)

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued to Diamond Aircraft Industries GmbH, N.A. Otto-Strasse 5, A-2700 Wiener Neustadt, Austria; telephone: 43 2622 26 700; facsimile: 43 2622 26 780, as part of the FAA Type Validation of the Diamond Aircraft Industries Model DA-42. This airplane will have novel and unusual design features when compared to the state of technology envisaged in the applicable airworthiness standards. These novel and unusual design features include the installation of a Garmin Model G-1000 electronic flight instrument system (EFIS) display, and digital engine controls. The applicable regulations do not contain adequate or appropriate airworthiness standards for the protection of these systems from the effects of high intensity radiated fields (HIRF). These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety

equivalent to the airworthiness standards applicable to these airplanes.

DATES: The effective date of these special conditions is June 22, 2005. Comments must be received on or before August 1, 2005.

ADDRESSES: Comments may be mailed in duplicate to: Federal Aviation Administration, Regional Counsel, ACE-7, Attention: Rules Docket Clerk, Docket No. 228, Room 506, 901 Locust, Kansas City, Missouri 64106. All comments must be marked: Docket No. 228. Comments may be inspected in the Rules Docket weekdays, except Federal holidays, between 7:30 a.m. and 4 p.m.

FOR FURTHER INFORMATION CONTACT: Wes Ryan, Aerospace Engineer, Standards Office (ACE-110), Small Airplane Directorate, Aircraft Certification Service, Federal Aviation Administration, 901 Locust, Room 301, Kansas City, Missouri 64106; telephone (816) 329-4127.

SUPPLEMENTARY INFORMATION: The FAA has determined that notice and opportunity for prior public comment hereon are impracticable because these procedures would significantly delay issuance of the approval and thus delivery of the affected aircraft. In addition, the substance of these special conditions has been subject to the public comment process in several prior instances with no substantive comments received. The FAA, therefore, finds that good cause exists for making these special conditions effective upon issuance.

Comments Invited

Interested persons are invited to submit such written data, views, or arguments, as they may desire. Communications should identify the regulatory docket or notice number and be submitted in duplicate to the address specified above. All communications received on or before the closing date for comments will be considered by the Administrator. The special conditions may be changed in light of the comments received. All comments received will be available in the Rules Docket for examination by interested persons, both before and after the closing date for comments. A report summarizing each substantive public contact with FAA personnel concerning this rulemaking will be filed in the docket. Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 228." The postcard will be

date stamped and returned to the commenter.

Background

Diamond Aircraft Industries (DAI) made application through European Aviation Safety Agency (EASA) for U.S. Type Certification for the Diamond Aircraft Model DA-42 on August 2, 2004. The Diamond DA-42 aircraft is a new fully composite, four place, twin-engine airplane with retractable gear, cantilever low wing and T-tail. The airplane was certified by EASA and listed on Type Certificate No. A005 dated May 13, 2004. Certification work was delegated to the Austrian Civil Authority as the JAA/Primary Certification Authority. The airplane is powered by two Thielert Aircraft Engines GmbH (Thielert) TAE 125-01 aircraft diesel engines (ADE). They are listed on U.S. engine TC No. E00069EN and incorporate two MT-propeller, MTV-6-A-C-F/CF187-129, U.S. TC No. P19NE. The fuel to be used for the Thielert TAE 125-01 aircraft diesel engine in USA is Jet A only. The Type Certification sought is for Day VFR/IFR operations.

As part of the FAA validation process for issuance of a Type Certificate in the United States for foreign applicants, the FAA is issuing these special conditions to address Certification Review Items (CRI) for novel and unusual features of the Diamond DA-42. The proposed type design incorporates novel or unusual design features, including the Garmin G1000 EFIS system, and digital engine controls that are vulnerable to HIRF external to the airplane.

Type Certification Basis

Based on the provisions of 14 CFR 21.17(c), 21.29 and the Austria-US BAA, and the FAA Order 8100.14, Interim Procedures for Working with the European Community on Airworthiness Certification and Continued Airworthiness and the Type Validation principles, the following airworthiness requirements are applicable to this project, and will remain active for three years from the date of application: The certification basis is based on the EASA/ACG certification basis as presented in CRI A-01, Issue 4, Joint Certification Basis and is harmonized at JAA JAR 23 Amendment 1, which is harmonized at 14 CFR part 23 Amendment 51. The FAA identified FAR/EASA Significant Standards Differences (SSDs), documented in our CRIs for the validation.

The Garmin G1000 was originally approved at part 23 Amendment 49 for § 23.1301, § 23.1309, § 23.1311, § 23.1322, and other applicable rules for

electronic displays, but is approved at Amendment 51 for this installation. The digital engine control was certified under part 33 and Amendment 20 with the engine, but is approved at part 23 Amendment 51 with the rest of the DA-42 for § 23.1309 and other applicable regulations for this installation. The certification basis also includes any applicable exemptions, equivalent levels of safety, and the terms of these special conditions.

Discussion

If the Administrator finds that the applicable airworthiness standards do not contain adequate or appropriate safety standards because of novel or unusual design features of an airplane, special conditions are prescribed under the provisions of § 21.16.

Special conditions, as appropriate, as defined in § 11.19, are issued in accordance with § 11.38 after public notice and become part of the type certification basis in accordance with § 21.101 (b)(2).

Special conditions are initially applicable to the model for which they are issued. Should the applicant apply for a supplemental type certificate to modify any other model already included on the same type certificate to incorporate the same novel or unusual design feature, the special conditions would also apply to the other model under the provisions of § 21.101.

Novel or Unusual Design Features

Diamond Aircraft, Inc. plans to incorporate certain novel and unusual design features into the Diamond DA-42 airplane for which the airworthiness standards do not contain adequate or appropriate safety standards for protection from the effects of HIRF. These features include the G1000 EFIS and two digital engine controls, which are susceptible to the HIRF environment and were not envisaged by the existing regulations for this type of airplane. Though the digital engine control systems were initially certificated to 14 CFR part 33, the regulatory requirements in 14 CFR part 23 for evaluating the installation of complex systems, including electronic systems, are contained in § 23.1309.

When § 23.1309 was developed, the use of electronic control systems for engines was not envisioned. The § 23.1309 requirements were originally not applied to systems certificated as part of an approved engine (§ 23.1309(f)(1)). Also, § 23.1309(f)(1) implies evaluation of the engine system's effects is not required. However, the installation specifics of the electronic engine control systems on

the DA-42 requires evaluation due to the possible effects on or by other airplane systems (e.g., radio interference with other airplane electronic systems, shared engine and airplane power sources) using § 23.1309. The integral nature of these systems makes it unfeasible to evaluate the airplane portion of the system without including the engine portion of the system. Also, electronic control systems often require inputs from airplane data and power sources and outputs to other airplane systems (e.g., automated cockpit powerplant controls such as mixture setting). Therefore, special conditions are proposed to provide HIRF protection for the EFIS and digital engine controls and to evaluate the installation for compliance with the requirements of § 23.1309(a) through (e) at Amendment 23-51 for the Diamond DA-42.

Protection of Systems From High Intensity Radiated Fields (HIRF)

Recent advances in technology have given rise to the application in aircraft designs of advanced electrical and electronic systems that perform functions required for continued safe flight and landing. Due to the use of sensitive solid-state advanced

components in analog and digital electronics circuits, these advanced systems are readily responsive to the transient effects of induced electrical current and voltage caused by the HIRF. The HIRF can degrade electronic systems performance by damaging components or upsetting system functions.

Furthermore, the HIRF environment has undergone a transformation that was not foreseen when the current requirements were developed. Higher energy levels are radiated from transmitters that are used for radar, radio, and television. Also, the number of transmitters has increased significantly. There is also uncertainty concerning the effectiveness of airframe shielding for HIRF. Furthermore, coupling to cockpit-installed equipment through the cockpit window apertures is undefined.

The combined effect of the technological advances in airplane design and the changing environment has resulted in an increased level of vulnerability of electrical and electronic systems required for the continued safe flight and landing of the airplane. Effective measures against the effects of

exposure to HIRF must be provided by the design and installation of these systems. The accepted maximum energy levels in which civilian airplane system installations must be capable of operating safely are based on surveys and analysis of existing radio frequency emitters. These special conditions require that the airplane be evaluated under these energy levels for the protection of the electronic system and its associated wiring harness. These external threat levels, which are lower than previous required values, are believed to represent the worst case to which an airplane would be exposed in the operating environment.

These special conditions require qualification of systems that perform critical functions, as installed in aircraft, to the defined HIRF environment in paragraph 1 or, as an option to a fixed value using laboratory tests, in paragraph 2, as follows:

(2) The applicant may demonstrate that the operation and operational capability of the installed electrical and electronic systems that perform critical functions are not adversely affected when the aircraft is exposed to the HIRF environment defined below:

Frequency	Field Strength (volts per meter)	
	Peak	Average
10 kHz–100 kHz	50	50
100 kHz–500 kHz	50	50
500 kHz–2 MHz	50	50
2 MHz–30 MHz	100	100
30 MHz–70 MHz	50	50
70 MHz–100 MHz	50	50
100 MHz–200 MHz	100	100
200 MHz–400 MHz	100	100
400 MHz–700 MHz	700	50
700 MHz–1 GHz	700	100
1 GHz–2 GHz	2000	200
2 GHz–4 GHz	3000	200
4 GHz–6 GHz	3000	200
6 GHz–8 GHz	1000	200
8 GHz–12 GHz	3000	300
12 GHz–18 GHz	2000	200
18 GHz–40 GHz	600	200

The field strengths are expressed in terms of peak root-mean-square (rms) values.

or,
 (2) The applicant may demonstrate by a system test and analysis that the electrical and electronic systems that perform critical functions can withstand a minimum threat of 100 volts per meter, electrical field strength, from 10 kHz to 18 GHz. When using this test to show compliance with the HIRF requirements, no credit is given for signal attenuation due to installation.

A preliminary hazard analysis must be performed by the applicant, for

approval by the FAA, to identify either electrical or electronic systems that perform critical functions. The term “critical” means those functions, whose failure would contribute to, or cause, a failure condition that would prevent the continued safe flight and landing of the airplane. The systems identified by the hazard analysis that perform critical functions are candidates for the application of HIRF requirements. A system may perform both critical and non-critical functions. Primary

electronic flight display systems, and their associated components, perform critical functions such as attitude, altitude, and airspeed indication. The HIRF requirements apply only to critical functions.

Compliance with HIRF requirements may be demonstrated by tests, analysis, models, similarity with existing systems, or any combination of these. Service experience alone is not acceptable since normal flight operations may not include an exposure

to the HIRF environment. Reliance on a system with similar design features for redundancy as a means of protection against the effects of external HIRF is generally insufficient since all elements of a redundant system are likely to be exposed to the fields concurrently.

Applicability

As discussed above, these special conditions are applicable to the Diamond DA-42 airplane. Should Diamond Aircraft, Inc. apply at a later date for a supplemental type certificate to modify any other model on the same type certificate to incorporate the same novel or unusual design feature, the special conditions would apply to that model as well under the provisions of § 21.101.

Conclusion

This action affects only certain novel or unusual design features on one model of airplane. It is not a rule of general applicability and affects only the applicant who applied to the FAA for approval of these features on the airplane.

The substance of these special conditions has been subjected to the notice and comment period in several prior instances and has been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. For this reason, and because a delay would significantly affect the certification of the airplane, which is imminent, the FAA has determined that prior public notice and comment are unnecessary and impracticable, and good cause exists for adopting these special conditions upon issuance. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment described above.

List of Subjects in 14 CFR Part 23

Aircraft, Aviation safety, Signs and symbols.

Citation

■ The authority citation for these special conditions is as follows:

PART 23—[AMENDED]

Authority: 49 U.S.C. 106(g), 40113 and 44701; 14 CFR 21.16 and 21.101; and 14 CFR 11.38 and 11.19.

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 validation basis for the Diamond DA-42 airplane with a Garmin G1000 EFIS and digital engine control systems.

1. *Protection of Electrical and Electronic Systems from High Intensity Radiated Fields (HIRF).* Each system that performs critical functions must be designed and installed to ensure that the operations, and operational capabilities of these systems to perform critical functions, are not adversely affected when the airplane is exposed to high intensity radiated electromagnetic fields external to the airplane.

2. *Electronic Engine Control System.* The installation of the electronic engine control system must comply with the requirements of § 23.1309(a) through (e) at Amendment 23-51. The intent of this requirement is not to re-evaluate the inherent hardware reliability of the control itself, but rather determine the effects, including environmental effects addressed in § 23.1309(e), on the airplane systems and engine control system when installing the control on the airplane. When appropriate, engine certification data may be used when showing compliance with this requirement.

3. 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 Kansas City, Missouri on June 22, 2005.

John R. Colomy,

Acting Manager, Small Airplane Directorate, Aircraft Certification Service.

[FR Doc. 05-12882 Filed 6-29-05; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2005-20355; Directorate Identifier 2004-NM-198-AD; Amendment 39-14177; AD 2005-13-40]

RIN 2120-AA64

Airworthiness Directives; Boeing Model 727 Airplanes, Equipped With an Auxiliary Fuel Tank Having a Fuel Pump Installed

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

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for Boeing Model 727 airplanes equipped with an auxiliary fuel tank having a fuel pump installed. This AD requires revising the airplane flight manual to include limitations on operating the fuel pumps for the auxiliary fuel tank. This AD is prompted by a design review of the fuel pump installation, which revealed a potential unsafe condition related to the auxiliary fuel tank(s). We are issuing this AD to prevent dry operation of the fuel pumps for the auxiliary fuel tank, which could create a potential ignition source inside the auxiliary fuel tank that could result in a fire or explosion of the auxiliary fuel tank.

DATES: This AD becomes effective August 4, 2005.

ADDRESSES: You may examine the AD docket on the Internet at <http://dms.dot.gov> or in person at the Docket Management Facility, U.S. Department of Transportation, 400 Seventh Street SW., Nassif Building, Room PL-401, Washington, DC.

FOR FURTHER INFORMATION CONTACT: Sulmo Mariano, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 917-6501; fax (425) 917-6590.

SUPPLEMENTARY INFORMATION:

Examining the Docket

You may examine the AD docket in person at the Docket Management Facility office between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The Docket Management Facility office (telephone (800) 647-5227) is located on the plaza level of the Nassif Building at the street address stated in the **ADDRESSES** section. This docket number is FAA-2005-20355; the directorate identifier for this docket is 2004-NM-198-AD.

Discussion

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an AD that would apply to Boeing Model 727 airplanes equipped with an auxiliary fuel tank having a fuel pump installed. That NPRM was published in the **Federal Register** on February 15, 2005 (70 FR 7695). That NPRM proposed to require revising the airplane flight manual (AFM) to include limitations on operating the fuel pumps for the auxiliary fuel tank.

Comments

We provided the public the opportunity to participate in the