

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 April 1, 2005.

**David R. Showers,**

*Acting Manager, Small Airplane Directorate, Aircraft Certification Service.*

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## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 23

[Docket No. CE221, Special Condition 23-161-SC]

#### Special Conditions; Twin Commander Aircraft Models 690C, 690D, 695, 695A, and 695B; 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 Twin Commander Aircraft LLC, 19010 59th DR. NE, Arlington, WA, 98223 for a Supplemental Type Certificate for the Twin Commander Aircraft Models 690C, 690D, 695, 695A, and 695B. These airplanes will have novel and unusual design features when compared to the state of technology envisaged in the applicable airworthiness standards. The novel and unusual design features include the installation of dual Innovative Solutions & Support (IS&S) Air Data Display Units (ADDU) for which 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 April 13, 2005.

Comments must be received on or before May 13, 2005 for domestic, August 11, 2005 for foreign.

**ADDRESSES:** Comments may be mailed in duplicate to: Federal Aviation Administration, Regional Counsel, ACE-7, Attention: Rules Docket Clerk,

Docket No. CE221, Room 506, 901 Locust, Kansas City, Missouri 64106. All comments must be marked: Docket No. CE221. 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. CE221." The postcard will be date stamped and returned to the commenter.

#### Background

On April 5, 2004, Twin Commander Aircraft LLC, 19010 59th DR NE, Arlington, WA, 98223, made application to the FAA for a new Supplemental Type Certificate for the Twin Commander Aircraft Models 690C,

690D, 695, 695A, and 695B. The Twin Commander Aircraft Models of concern are approved under TCDS No. 2A4. The proposed modification incorporates a novel or unusual design feature, a digital air data computer, which may be vulnerable to HIRF external to the airplane.

#### Type Certification Basis

Under the provisions of 14 CFR part 21, § 21.101, Twin Commander Aircraft LLC must show that the Twin Commander Aircraft Models 690C, 690D, 695, 695A, and 695B meet the following provisions, or the applicable regulations in effect on the date of application for the change. For those areas modified or impacted by the installation of the IS&S ADDU (Air Data Display Unit) system, the following paragraphs as amended by Amendments 23-1 through 23-54 must be complied with: 23.305, 23.307, 23.365, 23.603, 23.609, 23.611, 23.613, 23.625, 23.627, 23.771, 23.773, 23.777, 23.1301, 23.1303, 23.1309, 23.1311, 23.1321, 23.1322, 23.1331, 23.1335, 23.1351, 23.1357, 23.1359, 23.1361, 23.1365, 23.1367, 23.1381, 23.1431, 23.1529, 23.1541, 23.1543, 23.1581 and the special conditions adopted by this rulemaking action. For systems that are not modified or impacted by the installation, the original certification basis listed on TCDS No. 2A4 are still applicable.

#### 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.

Special conditions are initially applicable to the models 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

Twin Commander Aircraft LLC plans to incorporate certain novel and unusual design features into an 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 addition of a digital Air Data computer, which may be susceptible to the HIRF environment, that were not envisaged by the existing regulations for this type of airplane.

**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:

(1) 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:

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.

The applicant, for approval by the FAA, to identify either electrical or electronic systems that perform critical functions, must perform a preliminary hazard analysis. 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* Twin Commander Aircraft Models 690C, 690D, 695, 695A, and 695B. Should Twin Commander Aircraft LLC. 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.

**PART 23—AIRWORTHINESS STANDARDS; NORMAL, UTILITY, ACROBATIC, AND COMMUTER CATEGORY AIRPLANES**

**Citation**

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

**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 Twin Commander Aircraft Models 690C, 690D, 695, 695A, and 695B modified by Twin Commander Aircraft LLC. to add a digital Air Data computer.

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 April 1, 2005.

**David R. Showers,**

*Acting Manager, Small Airplane Directorate, Aircraft Certification Service.*

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**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

[Docket No. FAA-2005-20932; Directorate Identifier 2005-NE-11-AD; Amendment 39-14056; AD 2005-08-04]

**RIN 2120-AA64**

**Airworthiness Directives; General Electric Company (GE) CF6-45 and CF6-50 Series Turbofan Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule; request for comments.

**SUMMARY:** The FAA is adopting a new airworthiness directive (AD) for GE CF6-45 and CF6-50 series turbofan engines. This AD requires reviewing accumulated cyclic-life records of 10 life-limited rotating parts, correcting those records, and removing from service parts that exceed the low-cycle-fatigue (LCF) life limits published in the Engine Manual Chapter 5, Airworthiness Limitations Section (ALS). This AD results from an error in a tracking database that subtracted flight cycles of certain serial number (SN) parts from the actual accumulated cycles. We are issuing this AD to prevent rotating parts that may have exceeded their LCF life limit from failing, leading to uncontained engine failure.

**DATES:** This AD becomes effective April 28, 2005.

We must receive any comments on this AD by June 13, 2005.

**ADDRESSES:** Use one of the following addresses to comment on this AD.

- *DOT Docket Web site:* Go to <http://dms.dot.gov> and follow the instructions for sending your comments electronically.

- *Government-wide rulemaking Web site:* Go to <http://www.regulations.gov> and follow the instructions for sending your comments electronically.

- *Mail:* Docket Management Facility; U.S. Department of Transportation, 400 Seventh Street, SW., Nassif Building, Room PL-401, Washington, DC 20590-001.

- *Fax:* (202) 493-2251.

- *Hand Delivery:* Room PL-401 on the plaza level of the Nassif Building, 400 Seventh Street, SW., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:**

Karen Curtis, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; telephone (781) 238-7192; fax (781) 238-7199.

**SUPPLEMENTARY INFORMATION:** In March of 2005, GE informed us that a records review of a certain engine revealed that the number of cycles accumulated on that engine, and its life-limited rotating parts, were recorded incorrectly in the operator's database in 1989. GE has advised us that the engine and rotating parts actually have more cycles accumulated than currently recorded. Upon further investigation, GE has confirmed that that engine was affected by an error in a tracking database that subtracted flight cycles from the actual accumulated cycles on a total of 32 rotating parts.

GE advises that 22 of the 32 affected rotating parts are in the control of a foreign operator, and under the jurisdiction of the Direction Generale de L'Aviation Civile (DGAC), which is the airworthiness authority for France. The DGAC advises that there are three of the 32 parts installed on foreign registered airplanes, but not under the jurisdiction of the DGAC. The location, current cycle count, and corrected cycle count are known for these 25 parts. None of these 25 parts have exceeded their LCF life limit. GE advises that they do not know the locations or current cycle counts of the remaining seven affected rotating parts. These seven parts could be in service with accumulated cyclic life exceeding their LCF life limit. We are including the three parts mentioned previously with the seven parts, as being affected by this AD, to ensure their cyclic lives get corrected. This condition, if not corrected, could result in failure of rotating parts that may have exceeded their LCF life limit, leading to uncontained engine failure.

**FAA's Determination and Requirements of This AD**

The unsafe condition described previously is likely to exist or develop on other GE CF6-45 and CF6-50 series turbofan engines of the same type design. For that reason, we are issuing this AD to prevent rotating parts that may have exceeded their LCF life limit, from failing, leading to uncontained engine failure. This AD requires:

- Reviewing the engine records within 10 days after the effective date of this AD, for the existence of rotating parts listed by SN in this AD; and
- Correcting the records for those parts; and
- Within 100 cycles-in-service after the effective date of this AD, removing from service those parts exceeding their LCF life limits.

**FAA's Determination of the Effective Date**

Since an unsafe condition exists that requires the immediate adoption of this AD, we have found that notice and opportunity for public comment before issuing this AD are impracticable, and that good cause exists for making this amendment effective in less than 30 days.

**Comments Invited**

This AD is a final rule that involves requirements affecting flight safety and was not preceded by notice and an opportunity for public comment; however, we invite you to send us any written relevant data, views, or arguments regarding this AD. Send your