

For the Nuclear Regulatory Commission.
Annette L. Vietti-Cook,
Secretary of the Commission.
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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 23

[Docket No. CE226, Special Condition 23-166-SC]

Special Conditions; Tiger Aircraft, EFIS on the AG-5B; 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 Tiger Aircraft, 266 Pilot Way, Martinsburg, WV, 25401, for a change to the Type Design of the Tiger AG-5B. 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 an electronic flight instrument system (EFIS) in the form of a Garmin G1000 integrated avionics system. The current applicable regulations do not contain adequate or appropriate airworthiness standards for the protection of the 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 3, 2005. Comments must be received on or before July 14, 2005.

ADDRESSES: Comments may be mailed in duplicate to: Federal Aviation Administration, Regional Counsel, ACE-7, Attention: Rules Docket Clerk, Docket No. CE226, Room 506, 901 Locust, Kansas City, Missouri 64106. All comments must be marked: Docket No. CE226. 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 design 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. CE226." The postcard will be date stamped and returned to the commenter.

Background

Tiger Aircraft made application to the FAA for a change to the Type Design for the Tiger AG-5B. The AG-5B is currently approved under TC No. A16EA. It is a single engine airplane originally added to TC No. A16EA on September 21, 1990. The proposed modification to the AG-5B incorporates a novel or unusual design feature, or the Garmin G1000 EFIS display system that may be vulnerable to HIRF external to the airplane.

Type Certification Basis

Under the provisions of 14 CFR part 21, § 21.101, Tiger Aircraft must show that the Tiger AG-5B aircraft meets the original certification basis for the

airplane, as listed on Type Data Sheet A16EA, the additional certification requirements added for the Garmin 1000, exemptions, if any; and the special conditions adopted by this rulemaking action. The regulations that were applied at a later amendment than the original certification basis for the AG-5B to accommodate the Garmin G1000 EFIS include 23.1301 at amendment 20, 23.1309 at amendment 49, 23.1311 at amendment 49, 23.1322 at amendment 43, and 23.1353 at amendment 49. Further details of the certification basis for the installation of the G1000 EFIS are available on request.

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 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

Tiger Aircraft plans to incorporate certain novel and unusual design features into the AG-5B airplane for which the airworthiness standards do not contain adequate or appropriate safety standards for protection from the effects of HIRF. These features include an EFIS, which may be susceptible to the HIRF environment, that was 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 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

Frequency	Field strength (volts per meter)	
	Peak	Average
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 Tiger Aircraft AG–5B. Should Tiger Aircraft 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:

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 AG–5B airplane modified by Tiger Aircraft, LLC to add the Garmin G1000 EFIS 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 3, 2005.

Kim Smith,

*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-2005-21373; Directorate Identifier 2005-SW-13-AD; Amendment 39-14119; AD 2005-12-03]

RIN 2120-AA64

Airworthiness Directives; Sikorsky Aircraft Corporation Model S-92A Helicopters

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule; request for comments.

SUMMARY: This amendment adopts a new airworthiness directive (AD) for Sikorsky Aircraft Corporation (Sikorsky) Model S-92A helicopters. This action requires replacing the main gearbox (MGB) lubrication/scavenge pump vespel spline adapters (vespel spline adapters) before further flight, and thereafter, replacing them at certain intervals. This amendment is prompted by a reported incident of an in-flight loss of oil pressure. The actions specified in this AD are intended to prevent loss of lubrication to the MGB, which could cause failure of one or both engine input drives, or planetary gear to sun gear tooth mesh failure, resulting in loss of power to the rotor system and subsequent loss of control of the helicopter.

DATES: Effective June 29, 2005.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the **Federal Register** as of June 29, 2005.

Comments for inclusion in the Rules Docket must be received on or before August 15, 2005.

ADDRESSES: Use one of the following addresses to submit comments 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;

- **Fax:** (202) 493-2251; or

- **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.

You may get the service information identified in this AD from Sikorsky Aircraft Corporation, Attn: Manager, Commercial Tech Support, 6900 Main Street, Stratford, Connecticut 06614, phone (203) 386-3001, fax (203) 386-5983.

Examining the Docket

You may examine the docket that contains the AD, any comments, and other information on the Internet at <http://dms.dot.gov>, or in person at the Docket Management System (DMS) Docket Offices between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The Docket Office (telephone (800) 647-5227) is located on the plaza level of the Department of Transportation Nassif Building at the street address stated in the **ADDRESSES** section. Comments will be available in the AD docket shortly after the DMS receives them.

FOR FURTHER INFORMATION CONTACT: Wayne Gaulzetti, Aviation Safety Engineer, FAA, Boston Aircraft Certification Office, 12 New England Executive Park, Burlington, MA 01803, telephone (781) 238-7156, fax (781) 238-7170.

SUPPLEMENTARY INFORMATION: This amendment adopts a new AD for Sikorsky Model S-92A helicopters that have MGB lubrication/scavenge pump, part number (P/N) 92351-15800-101, with vespel spline adapter, P/N 1584000-1, installed. This action requires, before further flight, removing the two vespel spline adapters and replacing them with airworthy vespel spline adapters, and thereafter, replacing them at intervals not to exceed 50 hours time-in-service (TIS). This amendment is prompted by a report of a loss of oil pressure during a flight to an offshore oil rig. Subsequent investigation, which is continuing, reveals that the vespel spline adapter installed on the helicopter failed due to excessive wear. The actions specified in this AD are intended to prevent loss of lubrication to the MGB, which could cause failure of one or both engine input

drives, or planetary gear to sun gear tooth mesh failure, resulting in loss of power to the rotor system and subsequent loss of control of the helicopter.

We have reviewed Sikorsky Aircraft Corporation Alert Service Bulletin (ASB) No. 92-63-001, dated April 1, 2005, which describes procedures for removing and replacing the vespel spine adapter. This AD differs from the manufacturer's ASB in that we are incorporating only the necessary portion of the Accomplishment Instructions of the ASB and do not require returning the replaced parts to the manufacturer, nor do we require providing a report to the manufacturer.

This unsafe condition is likely to exist or develop on other helicopters of the same type design. Therefore, this AD is being issued to prevent loss of lubrication to the MGB, which could cause failure of one or both engine input drives, or planetary gear to sun gear tooth mesh failure, resulting in loss of power to the rotor system and subsequent loss of control of the helicopter. This AD requires removing the left-hand and right-hand main lubrication/scavenge pumps to access the vespel spline adapters and removing and replacing the vespel spline adapters before further flight and thereafter, at intervals not to exceed 50 hours TIS. Accomplish the actions in accordance with the ASB described previously.

The short compliance time involved is required because the previously described critical unsafe condition can adversely affect the controllability of the helicopter. Therefore, the initial replacement is required before further flight, and the repetitive replacements are required at intervals not to exceed 50 hours TIS, both of which are very short time periods, and this AD must be issued immediately.

Since a situation exists that requires the immediate adoption of this regulation, it is found that notice and opportunity for prior public comment hereon are impracticable, and that good cause exists for making this amendment effective in less than 30 days.

We estimate that this AD will affect 4 helicopters of U.S. registry. Replacing both vespel spline adapters will take approximately 3 work hours to accomplish at an average labor rate of \$65 per work hour. Required parts will cost approximately \$350 for each of the two adapters, however, the manufacturer has stated that they will provide the replacement parts at no charge until the end of the warranty period for the vespel spline adapter. Based on these figures, we estimate the total cost impact of the AD on U.S.