equipped with a digital Electronic Flight Instrument System (EFIS) that will perform critical functions. The applicable regulations do not contain adequate or appropriate safety standards for the protection of the EFIS from the effects of high-intensity radiated fields (HIRF). These special conditions provide the additional safety standards that the Administrator considers necessary to ensure that the critical functions performed by this system are maintained when the airplane is exposed to HIRF.

DATES: The effective date of these special conditions is May 26, 1995. Comments must be received on or before July 31, 1995.

ADDRESSES: Comments on these final special conditions, request for comments, may be mailed in duplicate to: Federal Aviation Administration, Office of the Assistant Chief Counsel, Attn: Rules Docket (ANM–7), Docket No. NM–110, 1601 Lind Avenue SW., Renton, Washington, 98055–4056; or delivered in duplicate to the Office of the Assistant Chief Counsel at the above address. Comments must be marked ''Docket No. NM–110.'' 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: Mark Quam, FAA, Standardization Branch, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington 98055–4056; telephone (206) 227–2145.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA has determined that good cause exists for making these special conditions effective upon issuance; however, interested persons are invited to submit such written data, views, or arguments as they may desire. Communications should identify the regulatory docket and special conditions 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. These special conditions may be changed in light of the comments received. All comments submitted 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. Persons wishing the FAA to acknowledge receipt of their comments submitted in response to this request must submit with those comments a self-addressed, stamped postcard on which the following statement is made: ''Comments to Docket No. NM–110.'' The postcard will be date stamped and returned to the commenter.

Background

On March 27, 1995, Learjet, Inc., of Denver, Colorado, applied for a supplemental type certificate to modify the Gulfstream American Corporation (GAC) Model 1159 airplane. The GAC Model 1159 airplane is a business jet with two aft-mounted turbofan engines. The airplane can carry two pilots and 19 passengers, depending on the exit and interior configuration, and is capable of operating to an altitude of 45,000 feet. The original equipment installed in these airplanes presented the required flight information in the form of analog displays. The proposed modification incorporates the installation of a five tube digital Electronic Flight Instrument System (EFIS) that displays required flight critical information and critical functions. The installation of the EFIS system displaying critical functions is potentially vulnerable to high-intensity radiated fields (HIRF) external to the airplane.

Supplemental Type Certification Basis

Under the provisions of § 21.101 of the Federal Aviation Regulations (FAR), Learjet, Inc., must show that the altered GAC Model 1159 airplane continues to meet the applicable provisions of the regulations incorporated by reference in Type Certificate No. A12EA, or the applicable regulations in effect on the date of application for the change. The regulations incorporated by reference in the type certificate are commonly referred to as the ''original type certification basis.''

The regulations incorporated by reference in Type Certificate No. A12EA include the following for the GAC Model 1159 airplanes: Civil Aviation Regulation (CAR) 4b dated December 31, 1953, including Amendments 4b–1 through 4b–14, Special Regulations SR422B and SR450A. In addition, under § 21.101(b)(1), the following sections of the FAR apply to the EFIS installation: 25.1301(d), 25.1303, and 25.1322, as amended by Amendment 25–38; and 25.1309, 25.1321(a)(b)(d), and (e), 25.1331, 25.1333, and 25.1335, as amended by Amendment 25–41. These special conditions will form an additional part of the supplemental type certification basis.

If the Administrator finds that the applicable airworthiness regulations (i.e., CAR 4b or part 25, as amended) do not contain adequate or appropriate safety standards for the GAC Model 1159 airplane because of a novel of unusual design feature, special conditions are prescribed under the provisions of § 21.16 to establish a level of safety equivalent to that established in the regulations.

Special conditions, as appropriate, are issued in accordance with § 11.49 of the FAR after public notice, as required by §§ 11.28 and 11.29, 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 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(a)(1).

Discussion

There is no specific regulation that addresses protection requirements for electrical and electric systems from high-intensity radiated fields (HIRF). Increased power levels from ground-based radio transmitters, and the growing use of sensitive electrical and electronic systems to command and control airplanes, have made it necessary to provide adequate protection.

To ensure that a level of safety is achieved equivalent to that intended by the regulations incorporated by reference, special conditions are needed for the modified GAC Model 1159 airplanes that would require that the EFIS be designed and installed to preclude component damage and interruption of function due to the effects of HIRF.

With the trend toward increased power levels from ground-based transmitters, plus the advent of space and satellite communications, coupled with electronic command and control of the airplane, the immunity of critical digital avionics systems, such as the EFIS, to HIRF must be established.

It is not possible to precisely define the HIRF to which the airplanes will be exposed in service. There is also uncertainty concerning the effectiveness of airframe shielding for HIRF. Furthermore, coupling of electromagnetic energy to cockpit-installed equipment through the cockpit window apertures is undefined. Based on surveys and analysis of existing HIRF emitters, an adequate level of protection exists when compliance with the HIRF protection special condition is shown with either paragraphs 1 or 2 below: