

9.3 Other (Describe) \_\_\_\_\_  
 \_\_\_\_\_  
 10. Alternates \_\_\_\_\_  
 11. Explanatory Notes \_\_\_\_\_

**Appendix B to § 1755.397—  
 Specification for Line Concentrators  
 Detailed Requirements; Bidder  
 Supplied Information**

Telephone Company (Owner)  
 Name: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Line Concentrator Equipment Locations  
 Central Office Terminal: \_\_\_\_\_  
 Remote Terminal: \_\_\_\_\_

**1. General**

1.1 The equipment and materials furnished by the bidder must meet the requirements of paragraphs (a) through (p) of this section.

1.2 Paragraph (a) through (p) of this section cover the minimum general requirements for line concentrator equipment.

1.3 Paragraph (q) of this section covers requirements for installation, inspection and testing when such service is included as part of the contract.

1.4 Appendix A of this section covers the technical data for application engineering and detailed equipment requirements insofar as they can be established by the owner. Appendix A of this section is to be filled in by the owner.

1.5 This appendix B covers detailed information on the line concentrator equipment, information as to system reliability and traffic capacity as proposed by the bidder. This appendix B shall be filled in by the bidder and must be presented with the bid.

**2. Performance Objectives**

2.1 Reliability (See paragraph (c) of this section)  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2.2 Busy Hour Load Capacity and Traffic Delay (See Paragraph (g) of this section)  
 \_\_\_\_\_  
 \_\_\_\_\_

**3. Equipment Quantities Dependent on System Design**

3.1 Transmission Facilities between the Central Office and Remote Terminals

Type	Quantity equipped	Quantity wired only
.....	.....	.....
.....	.....	.....
.....	.....	.....

**4. Power Requirements**  
**4.1 Central Office Terminal**  
 Voltage \_\_\_\_\_  
 Current Drain (Amps) Normal \_\_\_\_\_, Peak \_\_\_\_\_  
 Fuse Qty \_\_\_\_\_, Size \_\_\_\_\_, Type \_\_\_\_\_  
 Heat Dissipation (BTU/Hr.) \_\_\_\_\_  
**4.2 Remote Terminal**  
 AC or DC \_\_\_\_\_  
 Voltage \_\_\_\_\_  
 Current Drain (Amps) Normal \_\_\_\_\_, Peak \_\_\_\_\_  
 Fuse Qty \_\_\_\_\_, Size \_\_\_\_\_, Type \_\_\_\_\_  
 Heat Dissipation (BTU/Hr.) \_\_\_\_\_

Power required for heating or cooling equipment in remote bidder-furnished housing  
 \_\_\_\_\_

**5. Temperature and Humidity Limitations**

**5.1 Temperature**

	Central of- fice	Remote*
Maximum °F (°C) .....	.....	.....
Minimum °F (°C) .....	.....	.....

**5.2 Relative Humidity**

	Central of- fice	Remote*
Maximum .....	.....	.....
Minimum .....	.....	.....

\* Show conditions outside bidder-furnished housing.

**6. Explanatory Notes**

Dated: August 21, 1995.

**Jill Long,**

*Under Secretary, Rural Economic and Community Development.*

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**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 25**

[Docket No. NM-109; Special Conditions No. 25-NM-105]

**Special Condition: Gulfstream Aerospace Corporation, Model Gulfstream V, High-Intensity Radiated Fields**

**AGENCY:** Federal Aviation Administration, DOT.

**ACTION:** Final special conditions.

**SUMMARY:** These special conditions are for the Gulfstream Model Gulfstream V airplane. This new airplane will utilize new avionics/electronic systems that provide critical data to the flightcrew. The applicable regulations do not contain adequate or appropriate safety standards for the protection of these systems from the effects of high-intensity radiated fields. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards. **EFFECTIVE DATE:** September 28, 1995.

**FOR FURTHER INFORMATION CONTACT:** Gerald Lakin, FAA, Standardization Branch, ANM-113, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington 98055-4056, (206) 227-1187.

**SUPPLEMENTARY INFORMATION:**

**Background**

On February 26, 1992, Gulfstream Aerospace Corporation, P.O. Box 2206, Savannah, GA 31402-2206, applied for an amended type certificate in the transport airplane category for the Model Gulfstream V airplane. The Gulfstream V is a T-tail, low swept wing, business jet airplane powered by two Rolls-Royce BR710-48 turbofan engines mounted on pylons extending from the aft fuselage. Each engine will be capable of delivering 14,750 pounds thrust. The flight controls will be powered and capable of manual reversion. The airplane has a seating capacity of up to nineteen passengers, and a maximum takeoff weight of 89,000 pounds.

**Type Certification Basis**

Under the provisions of § 21.101 of the FAR, Gulfstream must show, except as provided in § 25.2, that the Model Gulfstream V meets the applicable provisions of part 25, effective February 1, 1965, as amended by Amendments 25-1 through 25-81. In addition, the proposed certification basis for the Model Gulfstream V includes part 34, effective September 10, 1990, plus any amendments in effect at the time of certification; and part 36, effective December 1, 1969, as amended by Amendment 36-1 through the amendment in effect at the time of certification. No exemptions are anticipated. These special conditions form an additional part of the type certification basis. In addition, the certification basis may include other special conditions that are not relevant to these special conditions.

If the Administrator finds that the applicable airworthiness regulations (i.e., part 25, as amended) do not contain adequate or appropriate safety standards for the Gulfstream V because of a novel or 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 type certificate for that model be amended later to include any other model that incorporates the same novel or unusual design feature, or should any other model already included on the same type certificate be modified 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).

**Novel or Unusual Design Features**

The Model Gulfstream V incorporates new avionic/electronic installations, including a digital Electronic Flight Instrument System (EFIS), Air Data System, Attitude and Heading Reference System (AHRS), Navigation and Communication System, Autopilot System, and a Full Authority Digital Engine Control (FADEC) system that controls critical engine parameters. These systems may be vulnerable to high-intensity radiated fields (HIRF) external to the airplane.

**Discussion**

There is no specific regulation that addresses protection requirements for electrical and electronic systems from 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 issued for the Gulfstream V which require that new technology electrical and electronic systems, such as the EFIS, FADEC, AHRS, etc., be designed and installed to preclude component damage and interruption of function due to both the direct and indirect effects of HIRF.

**High-Intensity Radiated Fields**

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 to HIRF must be established.

It is not possible to precisely define the HIRF to which the airplane 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 paragraph 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–2000 KHz ..	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–1000 MHz .	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 would be applicable initially to the Model Gulfstream V. Should Gulfstream apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, these 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 95–3–NM for the

Gulfstream Aerospace Corporation, Model Gulfstream V, was published in the **Federal Register** on June 1, 1995 (60 FR 28550). One comment was received. The commenter states that the presently proposed certification basis for the Gulfstream V is part 25 of the FAR as amended by Amendments 25–1 through 25–81 instead of through 25–75 as stated in the notice. The FAA agrees with the commenter and has incorporated the change in this document.

**Conclusion**

This action affects certain design features only on the Gulfstream V 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, Federal Aviation Administration, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

**Authority:** 49 U.S.C. app. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 1857f–10, 4321 et seq.; E.O. 11514, and 49 U.S.C. 106(g).

**The Special Conditions**

Accordingly, the following special conditions are issued as part of the type certification basis for the Gulfstream Aerospace Corporation Model Gulfstream V 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 August 18, 1995.

**Darrell M. Pederson,**

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

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