

**DEPARTMENT OF TRANSPORTATION****Federal Aviation Administration****14 CFR Part 25**

[Docket No. NM170; Notice No. 25-00-01-SC]

**Special Conditions: Raytheon Aircraft Company Model 4000; High Intensity Radiated Fields (HIRF)****AGENCY:** Federal Aviation Administration (FAA), DOT.**ACTION:** Notice of proposed special conditions.

**SUMMARY:** This notice proposes special conditions for the Raytheon Aircraft Company Model 4000 airplane. This airplane will utilize new avionics/electronics and electrical systems that will perform critical functions. 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 (HIRF). These proposed special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that provided by the existing airworthiness standards.

**DATES:** Comments must be received on or before April 13, 2000.

**ADDRESSES:** Comments on these proposed special conditions may be mailed in duplicate to: Federal Aviation Administration, Transport Airplane Directorate, Attn: Rules Docket (ANM-114), Docket No. NM170, 1601 Lind Avenue SW., Renton, Washington, 98055-4056; or delivered in duplicate to the Transport Airplane Directorate at the above address. Comments must be marked: Docket No. NM170. Comments may be inspected in the Rules Docket weekdays, except Federal holidays, between 7:30 a.m. and 4:00 p.m.

**FOR FURTHER INFORMATION CONTACT:** Mark Quam, FAA, Standardization Branch, ANM-113, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington, 98055-4056; telephone (425) 227-2145; facsimile (425) 227-1149.

**SUPPLEMENTARY INFORMATION:****Comments Invited**

Interested persons are invited to participate in the making of these special conditions by submitting 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 proposals contained in this notice 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. NM170." The postcard will be date stamped and returned to the commenter.

**Background**

On May 3, 1996, Raytheon Aircraft Company, PO Box 85, Wichita, Kansas 67201-0085, submitted an application for a new type certificate for the Raytheon Model 4000. The significant aircraft design features include an 84 inch diameter graphite composite fuselage, new metal wing and a graphite composite skin on aluminum sub-structure empennage. The Model 4000 is 69 feet, 2 inches in length and 61 feet, 9 inches in width. It has a Primus Epic flightdeck, and two aft mounted PW308A engines. There are 12 forward-facing seats and a forward observer seat. The significant systems features include a new state of the art integrated avionics/electronics and electrical systems suite. The avionics/electronics and electrical systems installed in this airplane have the potential to be vulnerable to high-intensity radiated fields (HIRF) external to the airplane.

**Type Certification Basis**

Under the provisions of 14 CFR 21.17, Raytheon Aircraft Company must show that the Model 4000 meets the applicable provisions of part 25, as amended by Amendment 25-1 through Amendment 25-87 thereto.

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 Raytheon Aircraft Company Model 4000 airplane because of novel or unusual design features, special conditions are prescribed under the provisions of 14 CFR 21.16.

In addition to the applicable airworthiness regulations and special conditions, the Model 4000 must comply with the part 25 fuel vent and exhaust emission requirements of 14

CFR part 34 and the part 25 noise certification requirements of 14 CFR part 36, and the FAA must issue a finding of regulatory adequacy pursuant to § 611 of Public Law 92-574, the "Noise Control Act of 1972."

Special conditions, as appropriate, are issued in accordance with § 11.49 after public notice, as required by §§ 11.28 and 11.29(b), and become part of the type certification basis in accordance with § 21.17(a)(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, the special conditions would also apply to the other model under the provisions of § 21.101(a)(1).

**Novel or Unusual Design Features**

The Raytheon Aircraft Company Model 4000 airplanes will utilize new avionics/electronics and electrical systems that will perform critical functions. These systems may be vulnerable to HIRF external to the airplane. The significant systems features include a new state of the art integrated avionics/electronics and electrical systems suite. The avionics/electronics and electrical systems installed in this aircraft have the potential to 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 avionics/electronics and electrical 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 Raytheon Aircraft Company Model 4000, which require that new avionics/electronics and electrical systems that perform critical functions 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 (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, and the use of composite material in the airplane structure, the immunity of critical avionics/electronics and electrical 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 rms per meter 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 for both of the following field strengths for the frequency ranges indicated.

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 of the root-mean-square (rms) over the computer modulation period.

The threat levels identified above are the result of an FAA review of existing studies on the subject of HIRF, in light of the ongoing work of the Electromagnetic Effects Harmonization Working Group of the Aviation Rulemaking Advisory Committee.

**Applicability**

As discussed above, these special conditions are applicable to the Model 4000 airplane. Should Raytheon Aircraft Company 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).

**Conclusion**

This action affects only certain design features on the Raytheon Aircraft Company Model 4000 airplanes. 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.

**List of Subjects in 14 CFR Part 25**

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

**PART 25—[AMENDED]**

The authority citation for these special conditions is as follows:

**Authority:** 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

**The Proposed Special Conditions**

Accordingly, the Federal Aviation Administration (FAA) proposes the following special conditions as part of the type certification basis for Raytheon Aircraft Company Model 4000 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 this special condition, 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 March 6, 2000.

**Vi L. Lipski**

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

[FR Doc. 00-6127 Filed 3-10-00; 8:45 am]

**BILLING CODE 4910-13-P**

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 71**

[Airspace Docket No. 00-AGL-06]

**Proposed modification of Class E Airspace; Holland, MI**

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

**ACTION:** Notice of proposed rulemaking.

**SUMMARY:** This action proposes to modify Class E airspace at Holland, MI. An Area Navigation (RNAV) Standard Instrument Approach Procedure (SIAP) to Runway (Rwy) 26 has been developed for Tulip City Airport. Controlled airspace extending upward from 700 feet or more above the surface of the earth is needed to contain aircraft executing this approach. This action would increase the radius of the existing Class E airspace for Tulip City Airport.

**DATES:** Comments must be received on or before May 1, 2000.

**ADDRESSES:** Send comments on the proposal in triplicate to: Federal Aviation Administration, Office of the Regional Counsel, AGL-7, Rules Docket No. 00-AGL-06, 2300 East Devon Avenue, Des Plaines, Illinois 60018.

The official docket may be examined in the Office of the Regional Counsel, Federal Aviation Administration, 2300 East Devon Avenue, Des Plaines, Illinois. An informal docket may also be examined during normal business hours at the Air Traffic Division, Airspace Branch, Federal Aviation Administration, 2300 East Devon Avenue, Des Plaines, Illinois.

**FOR FURTHER INFORMATION CONTACT:** Denis C. Burke, Air Traffic Division, Airspace Branch, AGL-520, Federal Aviation Administration, 2300 East Devon Avenue, Des Plaines, Illinois 60018, telephone (847) 294-7568.

**SUPPLEMENTARY INFORMATION:**

**Comments Invited**

Interested parties are invited to participate in this proposed rulemaking by submitting such written data, views, or arguments as they may desire. Comments that provide the factual basis supporting the views and suggestions presented are particularly helpful in developing reasoned regulatory decision on the proposal. Comments are specifically invited on the overall regulatory, aeronautical, economic, environmental, and energy-related aspects of the proposals. Communications should identify the airspace docket number and be