

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 Douglas Models DC-8-61, -61F, -63, -63F, -71, -71F, -72, -72F, -73, and -73F airplanes because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

In addition to the applicable airworthiness regulations and special conditions, the Douglas Models DC-8-61, -61F, -63, -63F, -71, -71F, -72, -72F, -73, and -73F airplanes must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36.

Special conditions, as defined in § 11.19, are issued in accordance with § 11.38 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 ABX Air, Inc., apply at a later date for a supplemental type certificate to modify any other models included on Type certificate No. 4A25 to incorporate the same or similar 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

The modified Douglas Models DC-8-61, -61F, -63, -63F, -71, -71F, -72, -72F, -73, and -73F airplanes will incorporate a new altitude display system, the Innovative Solutions and Support (IS&S) Duplex Reduced Vertical Separation Minimum (RVSM) system, which was not available at the time of certification of these airplanes, that performs critical functions. This system 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 needed for the Douglas Models DC-8-61, -61F, -63, -63F, -71, -71F, -72, -72F, -73, and -73F airplanes, modified by ABX Air, Inc. These special conditions require that new electrical and

electronic systems, such as the ADDU, 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, and the advent of space and satellite communications, coupled with electronic command and control of the airplane, the immunity of critical digital avionic/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 (root-mean-square) 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 of the field strengths indicated in the table below for the frequency ranges indicated. Both peak and average field strength components from the table below are to be demonstrated.

Frequency	Field strength (volts per meter)	
	Peak	Average
10 kHz–100 kHz	50	50
100 kHz–500 kHz		
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		
MHz	50	50
100 MHz–200 MHz		
MHz	100	100
200 MHz–400 MHz		
MHz	100	100
400 MHz–700 MHz		
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

Frequency	Field strength (volts per meter)	
	Peak	Average
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 complete 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 Douglas Models DC-8-61, -61F, -63, -63F, -71, -71F, -72, -72F, -73, and -73F airplanes modified by ABX Air Inc. Should ABX Air Inc. apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate No. 4A25 to incorporate the same or similar novel or unusual design feature, these 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 Douglas Models DC-8-61, -61F, -63, -63F, -71, -71F, -72, -72F, -73, and -73F airplanes modified by ABX Air Inc. It is not a rule of general applicability and affects only the applicant who applied to the FAA for approval of these features on these airplanes.

The substance of these special conditions has been subjected to the notice and comment procedure in several prior instances and has been derived without substantive change from those previously issued. 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 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

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

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