

show that the Model NA-265 series airplanes, as changed, continue to meet the applicable provisions of the regulations incorporated by reference in Type Certificate No. A2WE, 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 certification basis for the modified Sabreliner NA-265 series airplanes includes Civil Air Regulation (CAR) 4b, dated December 31, 1953, as amended by Amendments 4b-1 through 4b-9. In addition, under § 21.101(b)(1), Amendment 25-69, the following sections of 14 CFR part 25 apply to the air data, altimeter, and display systems installed on the Sabreliner NA-265 series airplanes: §§ 25.1309(a), (c), (e), (f), and (g), 25.1321(a), (b), (d), and (e), 25.1331, and 25.1335 as amended by Amendment 25-41; and § 25.1316, as amended by Amendment 25-80. The certification basis also includes other amendments and special conditions, as noted in Type Certificate Data Sheet (TCDS) No. A2WE, that are not relevant to these special conditions.

If the Administrator finds that the applicable airworthiness regulations (that is, CAR 4b, as amended) do not contain adequate or appropriate safety standards for the Sabreliner Model NA-265 series 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 Sabreliner Model NA-265 series airplanes must comply with the fuel vent and exhaust emission requirement of SFAR 27 (now codified as 14 CFR part 34) and the noise certification requirements of 14 CFR part 36.

Special conditions, as defined in 14 CFR 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 model for which they are issued. Should Sabreliner Corporation apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate No. A2WE to incorporate the same or similar novel or unusual design features, these special conditions would also apply to the other model under the provisions of § 21.101.

#### Novel or Unusual Design Features

As noted earlier, the Sabreliner Model NA-265 series airplanes modified by

Sabreliner Corporation will incorporate the installation of Air Data systems that perform critical functions. Because these advanced systems use electronics to a far greater extent than the original altimetry system, they may be more susceptible to electrical and magnetic interference caused by high-intensity radiated fields (HIRF) external to the airplane. The current airworthiness standards of part 25 do not contain adequate or appropriate safety standards for the protection of this equipment from the adverse effects of HIRF. Accordingly, these systems are considered to be a novel or unusual design feature.

#### 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 Model NA-265 series airplanes, modified by Sabreliner to include the new Air Data systems. These special conditions require that the Air Data systems, which 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 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 (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 identified in the table below for the frequency ranges indicated. Both peak and average field strength components from the table are to be demonstrated.

Frequency	Field strength (volts per meter)	
	Peak	Average
10 kHz–100 kHz	50	50
100kHz–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–1GHz	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

**Note.**—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 to Sabreliner Model NA-265 series airplanes modified by Sabreliner. Should Sabreliner Corporation apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate No. A2WE 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 Sabreliner