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## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 25

[Docket No. NM-118; Special Conditions No. 25-ANM-112]

#### Special Conditions: Israel Aircraft Industries (IAI), Model Galaxy, High-Intensity Radiated Fields

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

**ACTION:** Final special conditions.

**SUMMARY:** These special conditions are issued for the Israel Aircraft Industries (IAI) Model Galaxy airplane. The new airplane will utilize new avionics/electronic systems, such as electronic displays and electronic engine controls, that 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 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:** May 3, 1996.

**FOR FURTHER INFORMATION CONTACT:** Timothy Dulin, FAA, Standardization Branch, ANM-113, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington 98055-4056; telephone (206) 227-2141; facsimile (206) 227-1149.

#### SUPPLEMENTARY INFORMATION:

##### Background

On July 29, 1992, Israel Aircraft Industries (IAI), Ben Gurion International Airport, Tel Aviv 70100, Israel, applied for a new type certificate in the transport airplane category for the Model Galaxy airplane. On April 19,

1995, IAI applied for an extension of the original application and selected June 21, 1994, as the new reference date of application. The Model Galaxy is a derivative of the IAI Model 1125 Westwind Astra and is designed to be a long-range, high-speed airplane with a swept low wing and two aft-fuselage-mounted Pratt & Whitney Canada (PWC) 306A engines. The Model Galaxy will have a maximum takeoff weight of 33,450 pounds, a conventional empennage, a crew of two, and will be operated as an executive/corporate or commuter airplane with a maximum seating capacity of 19 passengers.

#### Type Certification Basis

Under the provisions of § 21.17, IAI must show, except as provided in § 25.2, that the Model Galaxy meets the applicable provisions of part 25, effective February 1, 1965, as amended by Amendments 25-1 through 25-82. In addition, the proposed certification basis for the Model Galaxy includes part 34, effective September 10, 1990, including all amendments in effect at the time of certification; and part 36, effective December 1, 1969, including all amendments 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 Model Galaxy 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 § 21.17(a)(2).

In addition to the applicable airworthiness regulations and special conditions, the Model Galaxy must comply with the fuel vent and exhaust emission requirements of part 34 and the noise certification requirements of 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 are initially applicable to the model for which they are issued. Should the type certificate for the 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 Model Galaxy airplane incorporates new avionics/electronic systems, such as electronic displays and electronic engine controls, that perform critical functions. These systems may be vulnerable to high-intensity radiated fields external to airplane.

#### Discussion

There is no specific regulation that addresses protection requirements for electrical and electronic systems for 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 applicable regulations, special conditions are needed for the IAI Galaxy to require that electrical and electronic 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, 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 paragraphs 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–2 MHz .... | 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–1 GHz ...  | 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 are applicable to the IAI Model Galaxy. Should IAI apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, the 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-95-6-NM for the IAI Model Galaxy airplanes was published in the Federal Register on October 30, 1995 (60 FR 55221). No comments were received, and the special conditions are adopted as proposed.

#### Conclusion

This action affects certain design features only on the IAI Galaxy 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, Reporting and record keeping requirements.

The authority citation for these special conditions is as follows:

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

#### The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for the IAI Model Galaxy 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 March 25, 1996.

Darrell M. Pederson,

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

[FR Doc. 96-8036 Filed 4-2-96; 8:45 am]

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#### 14 CFR Part 39

[Docket No. 94-NM-140-AD; Amendment 39-9558; AD 96-07-09]

#### Airworthiness Directives; Boeing Model 747-400, 757, and 767 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

**SUMMARY:** This amendment adopts a new airworthiness directive (AD), applicable to Boeing Model 747-400, 757, and 767 series airplanes, that requires a revision to the Airplane Flight Manual that advises flight crews to monitor the engine indication and crew alerting system (EICAS) for "status" level messages pertaining to impending engine fuel filter bypass. This amendment also requires the installation of upgraded EICAS computers that provide "advisory" level messages to indicate such bypass conditions. This amendment is prompted by a finding that EICAS computers currently installed on these airplanes do not provide an appropriate indication to the flight crew of an impending engine fuel filter bypass

condition. The actions specified by this AD are intended to ensure that the flight crew is appropriately aware of conditions involving a severely contaminated airplane fuel system and the associated increased potential for engine power loss.

**EFFECTIVE DATE:** May 3, 1996.

**ADDRESSES:** Information related to this action may be examined at the Federal Aviation Administration (FAA), Transport Airplane Directorate, Rules Docket No. 94-NM-140-AD, 1601 Lind Avenue, SW., Renton, Washington.

**FOR FURTHER INFORMATION CONTACT:** G. Michael Collins, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington; telephone (206) 227-2689; fax (206) 227-1181.

**SUPPLEMENTARY INFORMATION:** A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) to include an airworthiness directive (AD) that is applicable to Boeing Model 747-400, 757, and 767 series airplanes was published in the Federal Register on May 24, 1995 (60 FR 27446). That action proposed to require a revision to the FAA-approved Airplane Flight Manual (AFM) that would advise flight crews to monitor the engine indication and crew alerting system (EICAS) for "status" level messages pertaining to impending engine fuel filter bypass. That action also proposed to require the installation of upgraded EICAS computers that provide "advisory" level messages to indicate such bypass conditions.

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received.

#### Support for the Proposal

One commenter supports the proposed rule.

**Request To Withdraw the Proposal:** Addressed Unsafe Condition Is Extremely Remote

One commenter requests that the FAA define "unsafe condition" as required by part 39 ("Airworthiness directives") of the Federal Aviation Regulations (FAR) (14 CFR 39), and discern whether a condition is unsafe if its occurrence is "extremely remote." This commenter points out that data previously presented to the FAA demonstrate that the risk of solid particulate contaminated fuel in excess of that already addressed during engine certification is "less than  $1 \times 10^8$  [sic]," making such contamination an "extremely remote [sic]" event. This