

3.5.3.4 *Wireless Control Signal.* The power supplied to a ballast using a wireless signal is not easily measured, but is estimated to be well below 1.0 watt. Therefore, the wireless control signal power is not measured as part of this test procedure.

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## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 25

[Docket No. NM408; Special Conditions No. 25-391-SC]

#### Special Conditions: Alenia Model C-27J Airplane; Liquid Oxygen System

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

**ACTION:** Final special conditions.

**SUMMARY:** These special conditions are issued for the Alenia Model C-27J airplane. This airplane will have novel or unusual design features when compared to the state of technology described in the airworthiness standards for transport-category airplanes. These design features include a liquid-oxygen (LOX) system. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for oxygen systems that use liquid oxygen. 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.

**DATES:** *Effective Date:* November 23, 2009.

**FOR FURTHER INFORMATION CONTACT:** Tom Groves, FAA, International Branch, ANM-116, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, Washington 98057-3356; telephone (425) 227-1503, facsimile (425) 227-1149.

#### SUPPLEMENTARY INFORMATION:

##### Background

On March 27, 2006, the European Aviation Safety Agency (EASA) forwarded to the FAA an application from Alenia Aeronautica of Torino, Italy, for U.S. type certification of a twin-engine commercial transport designated as the Model C-27J. The C-27J is a twin-turbopropeller, cargo-transport aircraft with a maximum takeoff weight of 30,500 kilograms.

#### Type Certification Basis

Under the provisions of section 21.17 of Title 14, Code of Federal Regulations (14 CFR) and the bilateral agreement between the U.S. and Italy, Alenia Aeronautica must show that the C-27J meets the applicable provisions of 14 CFR part 25, as amended by Amendments 25-1 through 25-87. Alenia also elects to comply with Amendment 25-122, effective September 5, 2007, for 14 CFR 25.1317.

If the Administrator finds that existing airworthiness regulations do not adequately or appropriately address safety standards for the C-27J due to a novel or unusual design feature, the FAA prescribes special conditions under provisions of 14 CFR 21.16.

In addition to the applicable airworthiness regulations and special conditions, the C-27J 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, and the FAA must issue a finding of regulatory adequacy pursuant to § 611 of Public Law 92-574, the "Noise Control Act of 1972."

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type-certification basis under § 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 or similar novel or unusual design feature, the special conditions also apply to the other model under § 21.101.

#### Novel or Unusual Design Features

The Alenia Model C-27J incorporates a liquid-oxygen system, including a liquid-oxygen converter, valves, evaporating coils, lines, regulators, indicators, fittings, etc. The existing airworthiness regulations do not adequately or appropriately address safety standards for the design and installation of oxygen systems that utilize liquid oxygen. These special conditions for the C-27J 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 for these novel or unusual design features.

#### Discussion

There are no specific regulations that address the design and installation of oxygen systems that utilize liquid oxygen for storage. Existing

requirements, such as §§ 25.1309, 25.1441(b) and (c), 25.1451, and 25.1453, in the Alenia C-27J certification basis, provide some design standards for crew and medical-oxygen-system installations. However, additional design standards for oxygen systems utilizing liquid oxygen are needed to supplement the existing applicable requirements. The quantity of liquid oxygen involved in this installation and the potential for hazards that may result when the oxygen content of an enclosed area becomes too high because of system leaks, malfunction, or damage from external sources, make it necessary to assure adequate safety standards are applied to the design and installation of the system in Alenia C-27J airplanes. These special conditions require Alenia to preclude or minimize the risk of these potential hazards. These special conditions are also intended to assure the safe operation of the liquid-oxygen system, and therefore require that:

- Adequate gaseous oxygen is available at temperatures appropriate for breathing;
- The liquid-oxygen converter and gaseous-oxygen-distribution lines are installed in locations that minimize their potential for damage;
- The quantity of available oxygen is clearly indicated to the flight crew;
- The system is designed to prevent leakage of oxygen into the cabin;
- Condensation from the system is collected and drained overboard;
- The system must be protected from possible ignition sources and structural damage; and
- Appropriate maintenance and operational instructions are provided to ensure the system's safe operation.

Taken together, these requirements would ensure that this liquid-oxygen system provides an equivalent level of safety to traditional oxygen systems.

#### Discussion of Comments

Notice of proposed special conditions no. 25-09-04-SC for the Alenia model C-27J airplane was published in the **Federal Register** on July 13, 2009. No comments were received, and the special conditions are adopted as proposed.

#### Applicability

As discussed above, these special conditions are applicable to the Alenia C-27J. Should Alenia apply at a later date for a change to the type certificate to include another airplane model incorporating the same novel or unusual design features, these special conditions apply to that model as well under § 21.101.

## Conclusion

This action affects only certain novel or unusual design features of the Alenia C-27J. It is not a rule of general applicability, and it affects only the applicant that 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.

■ 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 C-27J airplane.

## General

1. The liquid-oxygen system must be located to minimize the possibility of exposure of occupants to liquid oxygen from a leak or condensation.

2. The liquid-oxygen converter must be located in the airplane so that there is no risk of damage to the converter due to an uncontained rotor or propeller-blade failure.

3. The liquid-oxygen system's associated gaseous-oxygen-distribution lines should be designed and located to minimize the hazard from uncontained rotor or propeller-blade debris.

4. The flight-deck oxygen system must meet the supply requirements of part 121 in the event the oxygen-distribution line is severed by a rotor or propeller-blade fragment.

5. The pressure-relief valves on the liquid-oxygen converters must be vented overboard. The ventilation means must be configured such that liquid and gaseous oxygen will be exhausted so that oxygen will not accumulate inside the airplane. Means must be provided to prevent hydrocarbon-fluid migration from impinging upon the vent outlet of the liquid-oxygen system.

6. The system must include provisions to ensure complete conversion of the liquid oxygen to gaseous oxygen. The resultant oxygen gas must be delivered to the first oxygen outlet for breathing such that the temperature is no more than 35°F less than the cabin ambient temperature or 32°F (whichever is greater), under the conditions of the maximum demand or flow of oxygen gas for normal use of the oxygen system. A liquid-oxygen shutoff valve must be installed on the main

oxygen-distribution line prior to any secondary lines. The shutoff valve must be both compatible with liquid-oxygen temperatures and readily accessible (either directly if manual, or by remote activation if automatic).

7. If multiple converters are used, the design should ensure that a leak in one converter does not result in leakage of oxygen from any other converter.

8. Approved flexible hoses must be used for the airplane-systems connections to shock-mounted converters, where movement relative to the airplane may occur.

9. Condensation from system components or lines must be collected by drip pans, shields, or other suitable collection means, and drained overboard through a drain fitting separate from the liquid-oxygen vent fitting, as specified in special condition 5, above.

10. Oxygen-system components must be burst-pressure tested to 3.0 times, and proof-pressure tested to 1.5 times, the maximum normal operating pressure. Compliance with the requirement for burst testing may be shown by similarity analysis, or a combination of similarity analysis and test.

11. Oxygen-system components must be electrically bonded to the airplane structure.

12. All gaseous or liquid-oxygen connections located in close proximity to an ignition source must be shrouded and vented overboard using the system specified in special condition 5, above.

13. A means must be provided to indicate to the flight crew the quantity of available oxygen.

14. Instructions for Continued Airworthiness (ICA) per § 25.1529 must be provided for the safe operation and maintenance of the liquid-oxygen system.

15. Emergency procedures must be developed for the aircraft crew to address aircraft-safety-related malfunctions of the liquid-oxygen system.

16. The liquid-oxygen-system equipment, including the tank, must be retained under all loads up to those specified in § 25.561(b)(3). The tank must be able to resist rupture and to retain the liquid oxygen, under the inertia forces prescribed for the emergency-landing conditions in § 25.561. In addition, the tank must be able to withstand, without failure, the vibration, inertia, fluid, and structural loads that it may be subjected to in operation. The liquid-oxygen components, including the tank, must

be protected from scraping or impact from baggage, cargo, or other contents.

**Ali Bahrami,**

*Manager, Transport Airplane Directorate, Aircraft Certification Service.*

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## DEPARTMENT OF TRANSPORTATION

### 14 CFR Part 97

[Docket No. 30691; Amdt. No. 3343]

### Standard Instrument Approach Procedures, and Takeoff Minimums and Obstacle Departure Procedures; Miscellaneous Amendments

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

**ACTION:** Final rule.

**SUMMARY:** This rule establishes, amends, suspends, or revokes Standard Instrument Approach Procedures (SIAPs) and associated Takeoff Minimums and Obstacle Departure Procedures for operations at certain airports. These regulatory actions are needed because of the adoption of new or revised criteria, or because of changes occurring in the National Airspace System, such as the commissioning of new navigational facilities, adding new obstacles, or changing air traffic requirements. These changes are designed to provide safe and efficient use of the navigable airspace and to promote safe flight operations under instrument flight rules at the affected airports.

**DATES:** This rule is effective October 22, 2009. The compliance date for each SIAP, associated Takeoff Minimums, and ODP is specified in the amendatory provisions.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of October 22, 2009.

**ADDRESSES:** Availability of matter incorporated by reference in the amendment is as follows:

#### For Examination

1. FAA Rules Docket, FAA Headquarters Building, 800 Independence Avenue, SW., Washington, DC 20591;

2. The FAA Regional Office of the region in which the affected airport is located;

3. The National Flight Procedures Office, 6500 South MacArthur Blvd., Oklahoma City, OK 73169 or