

lubrication, and adjustment during the required inspection of the system.

7. Operating Limitations

(a) Operating limitations must be prescribed to ensure proper operation of the system within its deployment envelope. A detailed discussion of the system, including operation, limitations and deployment envelope must be included in the Airplane Flight Manual.

(b) The deployment envelope of the GARD system must be possible at speeds up to V_0 or higher.

(c) Operating limitations must be prescribed for inspecting, repacking, and replacing the parachute and deployment mechanism at approved intervals.

Issued in Kansas City, Missouri on September 30, 1997.

Michael Gallagher,

Manager, Small Airplane Directorate Aircraft Certification Service.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM-135; Special Conditions No. 25-ANM-133]

Special Conditions: Boeing, Model 767-27C Airplanes, Airborne Warning and Control System (AWACS) Modification; Liquid Oxygen System

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for Boeing Model 767-27C airplanes modified by installation of an Airborne Warning and Control System (AWACS). These airplanes will be equipped with an oxygen system utilizing liquid oxygen (LOX). The applicable regulations do not contain adequate or appropriate safety standards for the design and installation of oxygen systems utilizing LOX for storage. These standards are intended to ensure that the design and installation of the liquid oxygen system is such that a level of safety equivalent to that established by the airworthiness standards for transport category airplanes is provided.

EFFECTIVE DATE: November 17, 1997.

FOR FURTHER INFORMATION CONTACT: William Schroeder, FAA, Standardization Branch, ANM-113, Transport Airplane Directorate, Airplane Certification Service, 1601

Lind Avenue SW, Renton, Washington 98055-4056; telephone (425) 227-2148.

SUPPLEMENTARY INFORMATION:

Background

On May 25, 1993, Boeing Commercial Airplane Group—Wichita Division, applied for a supplemental type certificate (STC) to modify Boeing Model 767-27C airplanes to an Airborne Warning and Control System (AWACS) configuration. The AWACS modification includes installation of equipment consoles, seats for console operators, a liquid oxygen (LOX) system (liquid oxygen converter, valves, evaporating coils, lines, regulators, indicators, fittings, etc.), and a radome on the top of the airplane. Boeing will modify the aft lower lobe with hydraulics for the AWACS antenna drive unit, high-powered radio frequency units for the AWACS radar, and other AWACS hardware. Boeing has designed the LOX installation to provide a supply of breathing oxygen sufficient to allow operation of the airplane in the unpressurized mode if this becomes necessary. The FAA will approve the performance of the oxygen system during certification testing.

There are no specific regulations that address the design and installation of oxygen systems that utilize liquid oxygen. Existing requirements, such as §§ 25.1309, 25.1441 (b) & (c), 25.1451, and 25.1453 in the Boeing Model 767-27C original type certification basis, applicable to this modification, provide some design standards for crew and medical oxygen system installations. However, the FAA must specify additional design standards for systems utilizing liquid oxygen to ensure that an acceptable level of safety is maintained.

Supplemental Type Certification Basis

Under the provisions of §§ 21.101 (a) and (b), Boeing Commercial Airplane Group must show that the modified Model 767-27C continues to meet the applicable provisions of the regulations incorporated by reference in Type Certificate (TC) No. A1NM, 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 regulations incorporated by reference in TC A1NM are basically as follows: Part 25 of the FAR, as amended by Amendments 25-1 through 25-37, plus certain later amended sections as specified in Type Certificate Data Sheet A1NM. In addition, the certification basis includes certain special conditions, exemptions

and optional requirements that are not relevant to these special conditions. Also, the modified Model 767-27C must continue to comply with the fuel venting and exhaust emission requirements of part 34 (previously Special Federal Aviation Regulation 27), and the noise certification requirements of part 36 in effect on the date the STC is issued.

If the Administrator finds that the applicable airworthiness regulations (i.e., part 25, as amended and applicable) do not contain adequate or appropriate safety standards for the modified Model 767-27C because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

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(b), and become part of the type certification basis in accordance with § 21.101(b)(2).

Special conditions are initially applicable to the model for which they are issued. Should the applicant apply for a supplemental type certificate to modify any other model included on the same type certificate to incorporate the same novel or unusual design feature, the special conditions would apply to the other model under the provisions of § 21.101(a)(1).

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 of the Boeing 767-200 series certification basis applicable to this STC project, provide some design standards appropriate for 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 unsafe conditions 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 Boeing Model 767-27C airplanes.

To ensure that a level of safety is achieved for modified Boeing Model 767-27C airplanes, utilizing liquid oxygen as a storage medium for an oxygen system, equivalent to that intended by the regulations incorporated by reference, special

conditions are needed which require those oxygen systems to be designed and installed to preclude or minimize the existence of unsafe conditions that can result from system leaks, malfunction, installation, or damage from external sources.

Application by Boeing for approval of oxygen systems utilizing liquid oxygen as a storage medium installed in transport airplanes, and the unsafe conditions that can exist when the oxygen content of an enclosed area becomes too high because of system leaks, malfunction, installation or damage from external sources, make development and application of appropriate additional design and installation standards necessary.

Discussion of Comments

On November 21, 1996, the FAA published Notice of Proposed Special Conditions No. SC-96-8-NM for the Boeing Model 767-27C liquid oxygen system installation in the **Federal Register** (61 FR 59202). The Department of the Air Force, commenting to the docket by letter, recommended additional requirements for design and installation of the LOX system. Based on some of those recommendations, the FAA revised special conditions f. and m. and republished the special conditions as Supplemental Notice SC-96-8A-NM on July 21, 1997 (62 FR 38945).

Boeing Commercial Airplane Group, the applicant, provided the only comments in response to Supplemental Notice SC-96-8A.

Boeing suggests that paragraph "f" of the special conditions be revised to read:

"The system shall 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. . . ."

The commenter proposes this change to address the case wherein the airplane may be operated unpressurized, and states that the purpose of the liquid oxygen system being a part of the AWACS modification is to provide a supply of breathing oxygen sufficient to allow operation of the airplane in the unpressurized mode, if this becomes necessary. The commenter's suggested revised wording would limit the lowest temperature of oxygen provided to the

occupants to 32 °F during pressurized and unpressurized operations.

The FAA concurs with the commenter. In the original Notice SC-96-8-NM for the Boeing Model 767-27C liquid oxygen system, the FAA proposed that the liquid oxygen system should include provisions to ensure complete conversion of the liquid oxygen to gaseous oxygen. This provision was included to address possible hazards that would exist if oxygen reaching the user was too cold. The Department of the Air Force, commenting in response to that notice, suggested that the proposed special condition be revised to further require that oxygen gas delivered to the first oxygen outlet for breathing have a temperature that was not colder than 20 °F below the cabin ambient temperature under the conditions of the maximum demand or flow of oxygen gas for normal use of the oxygen system. The commenter did not provide a specific reason to support this change. However, the FAA determined that the proposal was acceptable because it would ensure that the oxygen is delivered to the user at a temperature that is not harmful. The FAA therefore revised paragraph "f" of the proposed special condition accordingly and issued Supplemental Notice No. SC-96-8A-NM for comment.

The suggested temperature limits proposed by Boeing in response to the Supplemental Notice were reviewed by the FAA, including specialists at the FAA Civil Aeromedical Institute (CAMI). From these reviews, the FAA concluded that the suggested further limiting of temperature limits to "no more than 35 °F less than the cabin ambient temperature or 32 °F (whichever is greater)" is commensurate with the basic intent of the proposed special condition to ensure that the oxygen is delivered at a safe temperature to those breathing it. The FAA considers that this change provides an even higher level of safety than the original proposal. As it affects only the applicant who requested the change, further noticing of the special conditions is not considered necessary.

The remainder of the special conditions for the 767-27C liquid oxygen system installation are adopted as proposed.

As discussed above, these special conditions are applicable initially to the Boeing Model 767-27C airplane. Should Boeing Commercial Airplane Group 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 novel or unusual design features on one model series of airplane. 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.

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 Boeing Model 767-27C airplanes modified to an AWACS configuration:

a. The liquid oxygen converter and other oxygen equipment shall not be installed where baggage, cargo, or loose equipment are stored (unless items are stored within an appropriate container which is secured or restrained by acceptable means).

b. The liquid oxygen converter shall be located in the airplane so that there is no risk of damage due to an uncontained rotor or fan blade failure.

c. The liquid oxygen system and associated gaseous oxygen distribution lines should be designed and located to minimize the hazard from uncontained rotor debris.

d. The flight deck oxygen system shall meet the supply requirements of Part 121 after the distribution line has been severed by a rotor fragment.

e. The pressure relief valves on the liquid oxygen converters shall be vented overboard through a drain in the bottom of the airplane. Means must be provided to prevent hydrocarbon fluid migration from impinging upon the vent outlet of the liquid oxygen system.

f. The system shall 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 LOX shutoff valve shall be installed on the main oxygen distribution line prior to any secondary lines. The shutoff

valve must be compatible with LOX temperatures and be readily accessible (either directly if manual, or by remote activation if automatic).

g. If multiple converters are used and manifolded together, check valves shall be installed so that a leak in one converter will not allow leakage of oxygen from any other converter.

h. Flexible hoses shall be used for the airplane systems connections to shock-mounted converters, where movement relative to the airplane may occur.

i. Condensation from system components or lines shall 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 e. above.

j. Oxygen system components shall 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 analysis, or a combination of analysis and test.

k. Oxygen system components shall be electrically bonded to the airplane structure.

l. All gaseous or liquid oxygen connections located in close proximity to an ignition source shall be shrouded and vented overboard using the system specified in Special Condition e. above.

m. A means will be provided to indicate the quantity of oxygen in the converter and oxygen availability to the flightcrew. A low LOX level amber caution annunciation will be furnished to the flightcrew prior to the LOX converter oxygen level reaching the quantity required to provide sufficient oxygen for emergency descent requirements.

Issued in Renton, Washington, on October 1, 1997.

Darrell M. Pederson,

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

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 71

[Airspace Docket No. 97-AAL-9]

Revocation of Class D Airspace; Anchorage, Bryant AHP, AK, and Adak, AK; Revision of Class E Airspace; Adak, AK

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This action revokes the Class D airspace at Bryant Army Heliport (AHP), Anchorage, AK, and at Adak Naval Air Station (NAS), AK. The Department of the Army closed the Bryant AHP tower on September 27, 1995, and transferred operational control of Bryant AHP to the Alaska National Guard. The Department of the Navy closed the Adak tower on March 31, 1997, following the approval of the 1995 Base Realignment and Closure Commission's recommendation to close Adak NAS, AK, by the Congress of the United States. Additionally, the Class E airspace description at Adak, AK, will be revised to reflect part-time (less than 24-hours a day) operations. The intended effect of this action is to revise the effective times for the Class E airspace at Adak, AK, and also to revoke the Class D airspace at Bryant AHP, and at Adak NAS, AK, since the purpose and requirements for these surface areas no longer exist.

EFFECTIVE DATE: 0901 Coordinated Universal Time (UTC), November 17, 1997.

FOR FURTHER INFORMATION CONTACT: Robert van Haastert, Operations Branch, AAL-538, Federal Aviation Administration, 222 West 7th Avenue, Box 14, Anchorage, AK 99513-7587; telephone number (907) 271-5863; email; Robert.van.Haastert@faa.dot.gov; Internet: <http://www.alaska.faa.gov/at> or at <http://162.58.28.41/at>.

SUPPLEMENTARY INFORMATION:

Background

The Department of the Army closed the Bryant AHP tower on September 27, 1995, and transferred operational control of Bryant AHP to the Alaska National Guard. The Department of the Navy closed the Adak NAS tower on March 31, 1997, following the approval of the 1995 Base Realignment and Closure Commission's recommendation to close Adak NAS, AK, by the Congress of the United States. The purpose and requirements for these Class D surface areas no longer exist. The Class E effective times at Adak, AK, currently reflect continuous, 24-hour a day operations. This situation no longer exists and the effective times will be changed to indicate a part-time operation.

The coordinates for this airspace docket are based on North American Datum 83. The Class D airspace areas designated as surface areas are published in paragraph 5000 of FAA Order 7400.9E, Airspace Designations and Reporting Points, dated September

10, 1997, and effective September 16, 1997, which is incorporated by reference in 14 CFR 71.1(62 FR 52491; October 8, 1997). FAA Order 7400.9E, paragraph 6004, lists the Class E airspace areas designated as an extension to a Class D or Class E surface area. The Class D airspace descriptions listed in this document will be removed from the Order. The Class E airspace revision listed in this document will be published subsequently in the Order.

The Rule

The FAA is amending part 71 of the Federal Aviation Regulations (14 CFR part 71) to revoke the Class D airspace at Bryant Army Heliport (AHP), Anchorage, AK and at Adak NAS, AK. Additionally, the Class E effective times at Adak NAS, AK, will change from continuous to part time. The Class D airspace designation listed in this document will be revoked and the Class E airspace revision listed in this document will be published with two additional sentences to reflect the part-time effective times.

Accordingly, since the purpose and requirements for the Class D surface areas at Bryant AHP and Adak NAS no longer exist, notice and public procedure under 5 U.S.C. 553(b) for revoking this airspace are unnecessary. Since the closure of the tower is merely causing a reduction of the effective hours of the Class E airspace at Adak NAS, notice and public procedure under 5 U.S.C. 553(b) is unnecessary.

The FAA has determined that these regulations only involve an established body of technical regulations for which frequent and routine amendments are necessary to keep them operationally current. It, therefore—(1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979); and (3) does not warrant preparation of a regulatory evaluation as the anticipated impact is so minimal. Since this is a routine matter that will only affect air traffic procedures and air navigation, it is certified that this rule, when promulgated, will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 71

Airspace, incorporation by reference, Navigation (air).

Adoption of the Amendment

In consideration of the foregoing, the Federal Aviation Administration amends 14 CFR part 71 as follows: