113.1(g) and 113.2(a), as published at 60 FR 7862 (February 9, 1995), are effective as of April 5, 1995.

Dated: March 31, 1995.

Danny L. McDonald,

Chairman, Federal Election Commission.

[FR Doc. 95–8310 Filed 4–4–95; 8:45 am]

BILLING CODE 6715–01–M

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM–105, Special Conditions No. 25–ANM–97]

Special Conditions: Saab Aircraft AB Model Saab 2000 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are for the Saab Aircraft AB Model Saab 2000 airplane. This airplane will have novel and unusual design features, relating to its electronic flight control system, when compared to the state of technology envisioned in the airworthiness standards of part 25 of the Federal Aviation Regulations (FAR). These special conditions contain the additional safety standards which the Administrator considers necessary to establish a level of safety equivalent to that provided by the airworthiness standards of part 25.

EFFECTIVE DATE: March 29, 1995.

FOR FURTHER INFORMATION CONTACT: Mark I. Quam, FAA, Standardization Branch, ANM–113, Transport Standards Staff, Transport Airplane Directorate, Aircraft Certification Service, 1601 Line Avenue SW, Renton, Washington 98055–4056; telephone (206) 227–2145, facsimile (206) 277–1320.

SUPPLEMENTARY INFORMATION

Background

Special conditions are prescribed under the provisions of § 21.16 of the FAR when the applicable regulations for type certification do not contain adequate or appropriate standards because of novel or unusual design features. The new Saab 2000 incorporates a number of such design features.

The Saab 2000, certificated on April 29, 1994, is a twin-engined, low-wing, pressurized turboprop aircraft that is configured for approximately 50 passengers. The airplane has two Allison Engine Company AE 2100A engines rated at 3650 shp. The propeller is a 6 bladed Dowty Rotol swept shaped propeller. A single lever controls each prop/engine combination. An Auxiliary Power Unit (APU) will be installed in the tail. The airplane has provisions for two pilots, an observer, two flight attendants, overhead bins, a toilet, and provisions for the installation of a galley. There is a forward and aft stowage compartment and an aft cargo compartment. The airplane has a maximum operating altitude of 31,000 feet.

The Saab 2000 has a fully hydraulically powered electronically controlled rudder and will have fully hydraulically powered electronically controlled elevators as a follow-on design modification. The Powered Elevator Control System (PECS) provides control and power actuation of the left and right elevator surfaces. The PECS also provides aircraft stability augmentation and trim functions.

The proposed elevator system is in many respects similar to the rudder design and is comprised of a mix of analog and digital circuitry and has no mechanical backup. Control columns are connected to Linear Variable Differential Transducers (LVDT), stick damper(s), auto pilot servo, linear springs with break-outs and are interconnected with an electronic disconnect unit.

The position transducers (LVDT), connected to the control columns, provide signals to two Powered Elevator Control Units (PECU). Each PECU controls two Elevator Servo Actuators (ESA) through two separate Servo Actuator Channels (SAC). Each SAC is subdivided into a primary control lane and a monitor lane. Two of the four ESAs, controlled by one PECU, positions one elevator side.

The ESAs have two modes of operation, active and damped. The active mode will result when mode control current from the PECU and hydraulic pressure are available. One active servo actuator is sufficient to operate the elevator surface.

Elevator Servo Actuators valve and actuator ram position feedback are provided by position transducers (LVDT). The PECUs are connected to one Flight Control Computer via the trim relay and two Digital Air Data Computers. The flight control computer also provides a signal to the auto pilot servo.

Stick to elevator gearing is a function of Indicated Airspeed (IAS). Trim and stability augmentation are based on IAS, vertical acceleration and flap position. Stick, trim and elevator position and status information are fed to the Engine Indicating and Crew Alerting System (EICAS).

Each PECU has built in Automatic Preflight Built in test (PBIT) and Continuous Built In Test (CBIT) circuitry and utilizing cross channel nomitoring.

The elevator's actuators are supplied by three hydraulic circuits that are physically separated, isolated, fused and located to minimize common cause failures. The Number 1 hydraulic circuit is powered by the left engine and a backup DC pump and accumulators. The Number 2 hydraulic circuit is powered by the right engine and a backup AC pump and accumulators. THe Number 3 hydraulic circuit is powered by an AC drive pump.

The Number 1 hydraulic circuit powers the left hand (LH) and right hand (RH) outboard servo actuators. The Number 2 hydraulic circuit powers the RH inboard servo actuator. the Number 3 hydraulic circuit powers the LH inboard servo actuator.

Hydraulic warnings and cautions in the event of hydraulic supply failure are provided by the EICAS.

The elevator system is electrically supported by two system sides, a LH and a RH side. The electrical system is normally powered by two AC generators, each driven by a propeller gear box. An APU equipped with a standby generator is installed. When only one of the three generators is working, it supplies power to both LH and RH sides.

Each LH and RH AC system side is connected via a Transformer Rectifier Unit (TRU) to a LH and RH DC system made up of a network of DC buses. A third center TRU is connected to a center circuit. The LH, RH and center buses can be supplied from batteries or from the TRUs. The center TRU will replace a failed RH or LH TRU. When only one TRU unit is working, the LH and RH buses are tied together with power being received from the remaining TRU.

Two DC feeders in addition to two AC feeders provide power aft of the debris zone. The LH side is routed through the ceiling and the RH side is routed through the floor.

Type Certification Basis

The applicable requirements for U.S. type certification must be established in accordance with §§ 21.16, 21.17, 21.19, 21.29, and 21.101 of the FAR. Accordingly, based on the application date of June 9, 1989, and Saab Aircraft AB volunteering for certain later regulations, the TC basis for the Saab 2000 airplane is as follows:

Part 25 as amended by Amendments 25–1 through 25–71, except:

§ 25.361 Engine torque, as amended by Amendment 25–72.
§ 25.365 Pressurized compartment loads, as amended by Amendment 25–72.
§ 25.571 Damage tolerance and fatigue evaluation of structure, as amended by Amendment 25–72.
§ 25.772 Pilot compartment doors, as amended by Amendment 25–72.
§ 25.773 Pilot compartment view, as amended by Amendment 25–72.
§ 25.783(g) Doors, as amended by Amendment 25–72.
§ 25.905(d) Propellers, as amended by Amendment 25–72.
§ 25.933 Reversing systems, as amended by Amendment 25–72.
§§ 25.903 and 25.951 as amended by Amendment 25–73.
§§ 25.851 and 25.854 as amended by Amendment 25–74.
§ 25.729 as amended by Amendment 25–75.
§ 25.813 as amended by Amendment 25–76.

Part 34, as amended on the date of issuance of the type certificate.

Part 36, as amended on the date of issuance of the type certificate.

Special Conditions No. 25–ANM–66, dated 1/12/93, for Lightning and HIRF Protection.

Special Conditions No. 25–ANM–82, dated 3/11/94, for Interaction of Systems and Structure.

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).

Discussion

Special Conditions No. 25–ANM–82 were written for the rudder and in anticipation of the installation of the powered elevator. However, as the Saab 2000 could be flown without rudder control during certain failure conditions, and the elevator system was not installed for initial certification, Special Conditions No. 25–ANM–82 were limited to requirements common to both the rudder and follow-on elevator. The Saab 2000, however, requires control and power to the elevator all the time for safe flight and landing. Therefore, these special conditions supplement Special Conditions No. 25–ANM–82 for the powered elevator. The proposed type design of the Saab 2000 contains novel or unusual design features not envisioned by the applicable part 25 airworthiness standards and therefore special conditions are considered necessary in the following areas:

Systems

1. *Operation Without Normal Electrical Power.* In the Saab 2000, a source of electrical power is required by the elevator electronic flight control system. Service experience with traditional airplane designs has shown that the loss of electrical power generated by the airplane's engines is not extremely improbable. The electrical power system of the Saab 2000 must therefore be designed with standby or emergency electrical sources of sufficient reliability and capacity to power essential loads in the event of the loss of normally generated electrical power. The need for electrical power for electronic flight controls was not envisioned by part 25 since in traditional designs, cables and hydraulics are utilized for the flight control system. Therefore, Special Condition No. 1 is adopted as proposed.

2. *Command Signal Integrity.* Command and control of the control surfaces will be achieved by fly-by-wire systems that will utilize electronic (AC, DC, or digital) interfaces. These interfaces involve not only the commands to the control surfaces, but all the control feedback and sensor input signals as well. These signal paths, as well as the electronic equipment that manages them, can be susceptible to damage that may cause unacceptable or unwanted control responses. The damage may originate from electrical equipment failures, mechanical equipment failures or external damage. Therefore, special designs are needed to maintain the integrity of the fly-by-wire interfaces to an immunity level equivalent to that of traditional hydro-mechanical designs. Similar to the conventional steel cable controls, positioning of the electrical control equipment and routing of wire bundles must provide separation and redundancy to ensure maximum protection from damage due to a common cause. Therefore, Special Condition No. 2 is adopted as proposed.

3. *Design Maneuver Requirements.* In a conventional airplane, pilot inputs directly affect control surface movement (both rate and displacement) for a given flight condition. In the Saab 2000, the pilot provides only one of several inputs to the control surfaces, and it is possible that the pilot control displacements specified in §§ 25.331(c)(1), 25.349(a), and 25.351 of the FAR may not result in the maximum displacement and rates of displacement of the elevator. The intent of these noted rules may not be satisfied if literally applied. Therefore, Special Condition No. 3 is adopted as proposed.

Discussion of Comments

Notice of Proposed Special Conditions No. SC–95–1–NM for the Saab Aircraft AB Model Saab 2000 Series Airplanes was published in the **Federal Register** on February 2, 1995 (60 FR 6456). No comments were received.

Special conditions may be issued and amended as necessary, as part of the type certification basis if the Administrator finds that the airworthiness standards designated in accordance with § 21.17(a)(1) do not contain adequate or appropriate safety standards because of novel or unusual design features of an airplane. Special conditions, as appropriate, are issued in accordance with § 11.49 after public notice as required by §§ 11.28 and 11.29(b), effective October 14, 1980, and will become part of the type certification basis in accordance with § 21.17(a)(2).

Under standard practice, the effective date of these special conditions would be 30 days after publication in the **Federal Register**. As the intended U.S. type certification date for the Saab 2000 is April 1, 1995, the FAA finds that good cause exists to make these special conditions effective upon issuance.

Conclusion

This action affects only certain unusual or novel design features on one model series of airplanes. 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 airplanes.

List of Subjects in 14 CFR Part 25

Air transportation, Aircraft, Aviation safety, Safety.

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

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2); 42 U.S.C. 1857f–10, 4321 et seq.; E.O. 11514; and 49 U.S.C. 106(g).

The Special Conditions

Accordingly, the following special conditions are issued as part of the type certification basis for the Saab Aircraft AB Model Saab 2000 series airplanes.

1. *Operations Without Normal Electrical Power.* In lieu of compliance with § 25.1351(d), it must be demonstrated by test, or combination of test and analysis, that the airplane can continue safe flight and landing with inoperative normal engine generated electrical power (electrical power sources excluding the battery and any other standby electrical sources). The airplane operation should be considered at the critical phase of flight and include the ability to restart the

engines and maintain flight for the maximum diversion time capability being certified.

Discussion: The Electronic Flight Control System installations establish the criticality of the electrical power generation and distribution systems, since the loss of all electrical power may be catastrophic to the aircraft.

The Saab 2000 fly-by-wire control system requires a continuous source of electrical power in order to maintain the flight control system. The current § 25.1351(d), ''Operation Without Normal Electrical Power,'' requires safe operation in visual flight rules (VFR) conditions for at least five minutes with inoperative normal power. This rule was structured around a traditional design utilizing mechanical control cables for flight control while the crew took time to sort out the electrical failure and was able to re-establish some of the electrical power generation capability.

In order to maintain the same level of safety associated with traditional designs, the Saab 2000 design must not be time limited in its operation without the normal source of engine generated electrical power. It should be noted that service experience has shown that the loss of all electrical power which is generated by the airplane's engines is not extremely improbable. Thus, it must be demonstrated that the airplane can continue safe flight and landing with the use of its emergency electrical power systems (batteries, auxiliary power unit, etc.). This emergency electrical power system must be able to power loads that are essential for continued safe flight and landing. Also, the availability of emergency electrical power sources, including any credit taken for APU start reliability, must be validated in a manner acceptable to the FAA.

The emergency electrical power system must be designed to supply:

—electrical power required for immediate safety, which must continue to operate without the need for crew action following the loss of the normal electrical power system;

—electrical power required for continued safe-flight and landing;

—electrical power required to restart the engines.

For compliance purposes:

1. A test demonstration of the loss of normal engine generated power is to be established such that:

a. The failure condition should be assumed to occur during night instrument meteorological conditions (IMC) at the most critical phase of flight relative to the electrical power system design and distribution of equipment loads on the system.

b. After the unrestorable loss of the source of normal electrical power, the airplane engines must be capable of being restarted and operations continued in IMC until visual meteorological conditions (VMC) can be reached. (A reasonable assumption can be made that turbine engine driven transport category airplanes will not have to remain in IMC for more than 30 minutes after experiencing the loss of normal electrical power).

c. After 30 minutes of operation in IMC, the airplane should be demonstrated to be capable of continuous safe flight and landing in VMC conditions. The length of time in VMC conditions must be computed based on the maximum flight duration capability for which the airplane is being certified. Consideration for speed reductions resulting from the associated failure must be made.

2. Since the availability of the emergency electrical power system operation is necessary for safe-flight, this system must be available before each flight.

3. The emergency electrical power system must be shown to be satisfactorily operational in all flight regimes.

2. *Command Signal Integrity.* In addition to compliance with § 25.671 of the FAR, it must be shown that for the elevator Electronic Flight Control System (EFCS):

(a) Signals cannot be altered unintentionally, or that the altered signal characteristics are such that the control authority characteristics will not be degraded to a level that will prevent continued safe-flight and landing; and

(b) Routing of wire EFCS wires and wire bundles must provide separation and redundancy to ensure maximum protection from damage due to common cause.

Discussion: The Saab 2000 will be using fly-by-wire (FBW) as a means to command and control the elevator surface actuators. In the FBW design being presented, command and control of the control surfaces will be achieved by electronic (AC, DC, or digital) interfaces. These interfaces involve not only the direct commands to the elevator control surfaces, but feedback and sensor signals as well.

Malfunctions could cause system instabilities, loss of functions or freeze-up of the control actuator. It is imperative that after failure at least one path of the command signal, that is capable of providing safe flight and landing, remains continuous and unaltered.

The current regulations, which primarily address hydro-mechanical flight control systems, §§ 25.671 and 25.672, make no specific or implied reference that command and control signals remain unaltered from external interferences. Present designs feature steel cables and pushrods as a means to control hydraulic surface actuators. These designs are easily identifiable relative to the understanding that they are necessary for safe flight and landing and thus should be protected and continually inspected. However, the FBW designs are not easily discernible from non-essential electronics where placement of equipment and wire runs is not critical. Therefore, FBW requires additional attention when locating the equipment and wire runs.

It should be noted that:

—The wording ''signals cannot be altered unintentionally'' is used in the Special Condition to emphasize the need for design measures to protect the FBW control system from the effects of the fluctuations in electrical power, accidental damage, environmental factors such as temperature, local fires, exposure to reactive fluids, etc. and any disruptions that may affect the command signals as they are being transmitted from their source of origin to the Power Control Actuators.

3. *Design Maneuver Requirements*

(a) In lieu of compliance with § 25.331(c)(1) of the FAR, the airplane is assumed to be flying in steady level flight (point A1 within the maneuvering envelope of § 25.333(b)) and, except as limited by pilot effort in accordance with § 25.397(b), the cockpit pitching control device is suddenly moved to obtain extreme positive pitching acceleration (nose up). In defining the tail load condition, the response of the airplane must be taken into account. Airplane loads which occur subsequent to the point at which the normal acceleration at the center of gravity exceeds the maximum positive limit maneuvering factor, n, need not be considered.

(b) In addition to the requirements of § 25.331(c), it must be established that pitch maneuver loads induced by the system itself (e.g. abrupt changes in orders made possible by electrical rather than mechanical combination of different inputs) are acceptably accounted for.

Issued in Renton, Washington, on March 29, 1995.

Darrell M. Pederson,

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

[FR Doc. 95–8371 Filed 4–4–95; 8:45 am]

BILLING CODE 4910–13–M

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14 CFR Part 71

[Airspace Docket No. 95–AWA–5]

Modification of the Pensacola Regional, FL, Lexington Blue Grass, KY, Fayetteville Regional/Grannis Field, NC, Pope AFB, NC, and Providence, Theodore Francis Green State, RI, Class C Airspace Areas and Establishment of the Pensacola Regional, FL, and Providence Theodore Francis Green State, RI, Class E Airspace Areas

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This rule modifies the Class C airspace areas at Pensacola Regional, FL, Lexington Blue Grass, KY, Fayetteville Regional/Grannis Field, NC, Pope AFB, NC, and Providence, Theodore Francis Green State, RI, Airports. This action modifies the Lexington Blue Grass, KY, Fayetteville Regional/Grannis Field, NC, and Pope AFB, NC, airspace designations to reflect continuous operation and availability of services. The effective hours of the Pensacola Regional, FL, and Providence, Theodore Francis Green State, RI, Class C airspace areas are amended to coincide with the associated radar approach control facility's hours of operation. Class C airspace areas are predicated on an operational air traffic control tower