[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

Docket No. FAA-2013-1000; **Special Conditions No. 25-505-SC**

Special Conditions: Boeing Model 777-200, -300, and -300ER Series Airplanes; Aircraft Electronic System Security Protection from Unauthorized External Access.

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Boeing Model 777-200, -300, and - 300ER series airplanes. These airplanes, as modified by ARINC Aerospace Company, will have novel or unusual design features associated with Class 3 Electronic Flight Bags (EFB) and wireless local area data networks (LAN) associated with the EFB architecture and existing airplane network systems. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. 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: The effective date of these special conditions is **[Insert date of publication in the Federal Register].**

FOR FURTHER INFORMATION CONTACT: Varun Khanna, FAA, Airplane and Flight Crew Interface Branch, ANM-111, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW, Renton, Washington 98057-3356; telephone 425-227-1298; facsimile 425-227-1149.

SUPPLEMENTARY INFORMATION:

Background

On August 21, 2012, ARINC Aerospace Company applied for a change to Type Certificate No. T00001SE Rev. 30 dated June 6, 2012 for installation of Class 3 EFBs and related LANs in the Boeing Model 777-200, -300, and -300ER Series Airplanes. The Boeing Model 777-200 airplanes are long-range, wide-body, twin-engine jet airplanes with a maximum capacity of 440 passengers. The Boeing Model 777-300 and 777-300ER series airplanes have a maximum capacity of 550 passengers. The Model 777-200, -300, and -300ER series airplanes have fly-by-wire controls, software-configurable avionics, and fiber-optic avionics networks.

The proposed Class 3 EFB architecture is novel or unusual for commercial transport airplanes by allowing connection to previously isolated data networks connected to systems that perform functions required for the safe operation of the airplane. This proposed data network and design integration may result in security vulnerabilities from intentional or unintentional corruption of data and systems critical to the safety and maintenance of the airplane. The existing regulations and guidance material did not anticipate this type of system architecture or electronic access to aircraft systems. Furthermore, regulations and current system safety assessment policy and techniques do not address potential security vulnerabilities, which could be caused by unauthorized access to aircraft data buses and servers.

Type Certification Basis

Under Title 14, Code of Federal Regulations (14 CFR) 21.17, ARINC Aerospace Company must show that the Boeing Model 777-200, -300, and -300ER series airplanes meet the applicable provisions of 14 CFR part 25, as amended by the following for each model airplane:

For Model 777-200 airplanes--Title 14 CFR part 25, as amended by Amendment 25-1 through Amendment 25-82.

For Model 777-300 airplanes--Title 14 CFR part 25, as amended by Amendment 25-1 through Amendment 25-86.

For Model 777-300ER airplanes--Title 14 CFR part 25, as amended by Amendment 25-1 through Amendment 25-98.

In addition, the certification basis includes certain special conditions, exemptions, or later amended sections of the applicable part that are not relevant to these special conditions. Special conditions, as defined in Sec. 11.19, are issued in accordance with Sec. 11.38 and become part of the type certification basis in accordance with Sec. 21.101.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 25) do not contain adequate or appropriate safety standards for the Boeing Model 777-200, -300, and -300ER series airplanes because of a novel or unusual design feature, special conditions are prescribed under § 21.16.

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 novel or unusual design feature, the proposed special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and proposed special conditions, the Boeing Model 777-200, -300, and -300ER series airplanes 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 under § 611 of Public Law 92-574, the "Noise Control Act of 1972."

The FAA issues special conditions, as defined in 14 CFR 11.19, under § 11.38, and they become part of the type-certification basis under § 21.17(a)(2).

Novel or Unusual Design Features

The Boeing Model 777-200, -300, -300ER series airplanes will incorporate the following novel or unusual design features:

Multiple Electronic Flight Bags (EFBs) and several connected networks that will interface to existing aircraft systems. The proposed network architecture is used for a diverse set of functions, providing data connectivity between systems, including:

1. Flight-safety related control and navigation systems,
2. Operator business and administrative support (operator information services),
3. Passenger information systems, and,
4. Access by systems external to the airplane.

Discussion

The architecture and network configuration in the Boeing Model 777-200, -300, and - 300ER series airplanes may allow increased connectivity to, or access by, external airplane sources, airline operations, and maintenance systems to the aircraft control functions and airline information services. The aircraft control functions and airline information services perform functions required for the safe operation and maintenance of the airplane. Previously these functions and services had very limited connectivity with external sources. The architecture and network configuration may allow the exploitation of network security vulnerabilities resulting in intentional or unintentional destruction, disruption, degradation, or exploitation of data, systems, and networks critical to the safety and maintenance of the airplane. The existing regulations and guidance material did not anticipate these types of airplane system architectures. Furthermore, 14 CFR regulations and current system safety assessment policy and techniques do not address potential security vulnerabilities, which could be exploited by unauthorized access to airplane systems, data buses, and servers. Therefore, these special conditions are issued to ensure that the security (i.e., confidentiality, integrity, and availability) of airplane systems is not compromised by unauthorized wired or wireless electronic connections.

For the reasons discussed above, 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.

Applicability

As discussed above, these special conditions are applicable to the Boeing Model 777-200, -300, -300ER series airplanes. Should ARINC Aerospace Company apply at a later date for a change to the type certificate to include another model on the same type certificate incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features on Boeing Model 777-200, -300, -300ER series airplanes. It is not a rule of general applicability.

The substance of these special conditions has been subjected to the notice and comment period in several prior instances and has been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. Therefore, the FAA has determined that prior public notice and comment are unnecessary, and good cause exists for adopting these special conditions upon publication in the *Federal Register*.

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 777-200, -300, -300ER series airplanes modified by ARINC Aerospace Company.

Aircraft Electronic System Security Protection from Unauthorized External Access.

1. The applicant must ensure airplane electronic system security protection from access by unauthorized sources external to the airplane, including those possibly caused by maintenance activity.
2. The applicant must ensure that electronic system security threats are identified and assessed, and that effective electronic system security protection strategies are implemented to protect the airplane from all adverse impacts on safety, functionality, and continued airworthiness.
3. The applicant must establish appropriate procedures to allow the operator to ensure that continued airworthiness of the aircraft is maintained, including all post Type Certification modifications that may have an impact on the approved electronic system security safeguards.

Issued in Renton, Washington, on November 15, 2013

John Piccola
Acting Manager, Transport Airplane Directorate
Aircraft Certification Service

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