

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.*

[FR Doc. 2013-28407 Filed 11-26-13; 8:45 am]

**BILLING CODE 4910-13-P**

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 25

[Docket No. FAA-2013-0999; Special Conditions No. 25-506-SC]

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

**DATES:** *Effective Date:* The effective date of these special conditions is November 27, 2013.

#### **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 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 internal to the airplane.

#### Discussion

The integrated network configurations in the Boeing Model 777-200, -300, and -300ER series airplanes may allow increased connectivity with external network sources and will have more interconnected networks and systems, such as passenger entertainment and information services than previous airplane models. This may allow the exploitation of network security vulnerabilities and increased risks potentially resulting in unsafe conditions for the airplanes and occupants. This potential exploitation of security vulnerabilities may result in intentional or unintentional destruction, disruption, degradation, or exploitation of data and systems critical to the safety and maintenance of the airplane. The existing regulations and guidance material did not anticipate these types of 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 networks and servers. Therefore, these special conditions are being 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 between airplane systems and the passenger entertainment services.

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 Internal Access*

1. The applicant must ensure that the design provides isolation from, or airplane electronic system security protection against, access by unauthorized sources internal to the airplane. The design must prevent inadvertent and malicious changes to, and all adverse impacts upon, airplane equipment, systems, networks, or other assets required for safe flight and operations.

2. The applicant must establish appropriate procedures to allow the

operator to ensure that continued airworthiness of the aircraft is maintained, including all post STC 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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## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 39

[Docket No. FAA-2013-0974; Directorate Identifier 2013-NM-209-AD; Amendment 39-17675; AD 2013-24-01]

RIN 2120-AA64

#### Airworthiness Directives; The Boeing Company Airplanes

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

**ACTION:** Final rule; request for comments.

**SUMMARY:** We are adopting a new airworthiness directive (AD) for The Boeing Company Model 747-8 and 747-8F series airplanes and Model 787-8 airplanes powered by GENx engines. This AD requires revising the airplane flight manual to advise the flight crew of potential ice crystal icing (ICI) conditions at high altitudes, and to prohibit operation in moderate and severe ICI conditions. This AD also requires inspecting the engine after any ICI event is detected by the flight crew. This AD was prompted by reports of engine damage and thrust loss events as a result of flying in high altitude ICI conditions. We are issuing this AD to ensure that the flight crews have operating instructions to avoid flight into ICI conditions that can lead to engine damage and thrust loss events; unrecoverable thrust loss on multiple engines can lead to a forced landing.

**DATES:** This AD is effective November 27, 2013.

We must receive comments on this AD by January 13, 2014.

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- *Federal eRulemaking Portal:* Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- *Fax:* 202-493-2251.

- *Mail:* U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

- *Hand Delivery:* U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

#### Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: 800-647-5527) is in the **ADDRESSES** section. Comments will be available in the AD docket shortly after receipt.

**FOR FURTHER INFORMATION CONTACT:** Sue Lucier, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, Seattle Aircraft Certification Office (ACO), 1601 Lind Avenue SW., Renton, Washington 98057-3356; phone: 425-917-6438; fax: 425-917-6590; email: [suzanne.lucier@faa.gov](mailto:suzanne.lucier@faa.gov).

#### SUPPLEMENTARY INFORMATION:

##### Discussion

Over the past decade, we have been aware of temporary engine thrust loss, and other engine-related events that occurred in ice crystal icing (ICI) conditions at high altitudes. These events have prompted the release of ADs on various airplane models equipped with General Electric (GE) CF6-80 series engines. Each event was in or near convective weather conditions that included ice crystal icing.

This type of icing does not appear on radar due to its low reflectivity, and neither the airplane ice detector nor visual indications reliably indicate the presence of icing conditions. Therefore, it is often undetected by the flight crew. Flight in these conditions can cause ice crystals to accumulate in the core gas flow path of the engine. In the events leading to those prior ADs, the ice has shed during throttle transients and in the descent phase of flight, causing temporary thrust loss.

Since the beginning of 2013, similar events have now occurred on Model 747-8 and 747-8F series airplanes powered by GENx-2B engines and Model 787-8 airplanes powered by

GENx-1B engines. The new events that prompted this AD, however, have occurred during the cruise phase of flight and caused permanent damage (beyond maintenance manual limits) to the engine compressor. In all thrust loss events, data indicate that ice crystals entered and collected in the initial stages of the compressor. Engine temperature data indicate small ice accretions were shed through the core of the engine.

All of these ICI events occurred during cruise at 33,000 feet or above, either within or after the airplane traversed a large Mesoscale Convective System (MCS). MCSs are areas where several thunderstorms have merged, with a continuous cloud larger than 100 kilometers (62 miles) across.

Within or near MCSs, ICI events have occurred where convective activity has driven a significant quantity of moisture, in the form of ice crystals, to altitudes at or above the tropopause. ICI events tend to occur in warm geographic locations.

As of the date of this AD, there have been nine events on Model 747-8 airplanes and Model 787-8 airplanes.

During two events on Model 747-8F airplanes, two engines experienced thrust losses during the cruise phase of flight. In one of these events, one of the engines recovered to idle but would not accelerate and was left at idle for the rest of the flight. The other engine recovered and operated normally for the rest of the flight. In both airplane events, subsequent inspections of all four engines revealed compressor damage on both of the event engines as well as damage to a third engine that had not experienced a thrust loss.

In four other events—one on a Model 787-8 airplane and three on Model 747-8 airplanes—uncommanded engine decelerations (i.e., thrust losses) of approximately 20 seconds in duration occurred. All engines automatically recovered commanded thrust without crew action and operated normally for the rest of the flight.

In three other events on Model 747-8 airplanes, at least one engine showed elevated vibrations on the low-speed engine spool (N1) while in ICI conditions. The vibrations stopped after the airplanes exited the weather system, and the engines operated normally for the rest of the flight.

Unrecoverable thrust loss on multiple engines, due to operation in high altitude clouds containing ice crystals, could lead to a forced landing.

#### FAA's Determination

We are issuing this AD because we evaluated all the relevant information