Exemption No. 11068

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98057-3356

In the matter of the petition of **The Boeing Company** for an exemption from §§ 25.777(a); 25.1301(a),(b), and (d); and 25.1309(a) and (c) of Title 14, Code of Federal Regulations	**Regulatory Docket No. FAA-2014-0091**

GRANT OF EXEMPTION

By letter no. RA-14-00771, dated February 28, 2014, Mr. Douglas M. Lane, ODA Deputy Lead Administrator, The Boeing Company, P.O. Box 3707 MC 03-56, Seattle, WA 98124, petitioned for an exemption from the requirements of §§ 25.777(a); 25.1301(a),(b), and (d); and 25.1309(a) and (c) at Amendment 25-46 of Title 14, Code of Federal Regulations (14 CFR), to permit relief from the requirements to minimize crew confusion regarding the location, inadvertent operation, functionality, labeling, and design of certain flight-deck controls, buttons, and switches on Boeing Model 767-2C airplanes.

The petitioner requests relief from the following regulations:

> **Section 25.777(a) at Amendment 25-46** — requires that each cockpit control must be located to prevent confusion and inadvertent operation.
>
> **Section 25.1301(a) at Amendment 25-0** — requires that each item of installed equipment must be of a kind and design appropriate to its intended function.
>
> **Section 25.1301(b) at Amendment 25-0** — requires that each item of installed equipment must be labeled as to its operating limitations.
>
> **Section 25.1301(d) at Amendment 25-0** — requires that each item of installed equipment must function properly when installed.
>
> **Section 25.1309(a) at Amendment 25-41** — requires that required equipment must perform intended function under any foreseeable operating condition.

Section 25.1309(c) at Amendment 25-41 — requires that controls must be designed to minimize crew errors.

The petitioner supports their request with the following information.

This section summarizes and quotes, in pertinent part, the relevant information from the petitioner's request, with minor edits for clarity. The complete petition is available at the Department of Transportation's Federal Docket Management System, on the Internet at http://regulations.gov, in docket no. FAA-2014-0091.

Boeing is developing a commercial derivative of the 767-200 (i.e., the 767-2C) that provides increased capabilities such as Maximum Takeoff Weight (MTOW), upgraded flight deck, etc. The first 767-2C customer plans to have certain additional features, capabilities, and equipment installed after the amended type certificate (ATC) is granted. These modifications will be installed via an FAA-approved supplemental type certificate (STC).

Certain switches, equipment, and components are proposed to be included as part of the ATC project that will support the subsequent STC installation. However, the components' installation results in some non-compliances with the aforementioned regulations. The overall cost of manufacturing the airplane can be reduced, and potential errors avoided, if these switches, equipment, and components are included as part of the 767-2C manufacturing process, rather than reworking the airplane to install them post-ATC.

This exemption is limited to the 767-2C ATC configuration with the following design features:

STC provisioned operational switches that can be set to a position that would result in a non-compliant condition:

- six-position rotary switch
- continuously variable switch
- on-off push button switch

STC provisioned non-operational switches:

- on-off push button switch
- continuously variable
- guarded toggle switch
- three-position rotary switch

The installation of these switches causes a short-term noncompliance that will be resolved by the installation of the STC. At the completion of the STC project, the switches will enable additional customer-specific functionality, and the inoperative switches will meet all applicable FAA requirements. Full compliance will be demonstrated for the STC, and this exemption will no longer be applicable to the airplane in the final configuration.

Switches with Additional Customer Specific Functionality

Six Position Rotary Switch

In support of the STC project, a six-position rotary switch will be provided. Position 1 is compliant with all applicable FAA regulations, and compliance will be demonstrated for ATC. Positions 2-6 do not meet FAA requirements.

Continuously Variable Switch

In support of the STC project, a continuously variable Switch will be made functional on the ATC project. In the MAX position, this item will be compliant to all applicable FAA regulations, and compliance will be demonstrated for ATC. When the switch is not in the MAX position, the functionality controlled by the switch does not meet the FAA requirements.

On-Off Pushbutton Switch

In support of the STC project, an on-off pushbutton switch will be included on the ATC project. When the switch is OFF, all associated functionality operates normally. Compliance to all applicable regulations will be demonstrated for ATC with the pushbutton in the OFF position. When the switch is in the ON position, the functionality does not meet FAA requirements. The pilots will receive an engine-indicating-and-crew-alerting system (EICAS) Memo message when the on-off pushbutton is in the 'ON' position which provides additional awareness of the selected switch position.

Inoperative Switches

In support of the STC project, guarded toggle, three-position rotary, on-off push button, and continuously variable switches will be added to the ATC flight deck. For ATC, these switches will not be functional. "Inoperative" (INOP) placards will be added to provide the pilot with an awareness that the switches are non-functional.

Public Interest

Boeing argues that deferring the design, installation, and testing of the systems supported by the aforementioned switches until after the 767-2C is built and certified would result in the total program cost being unnecessarily higher than needed.

A more economical option is to provision the 767-2C with such systems and equipment to the extent allowed by the FAA. As previously mentioned, when modified by the STC, the airplane will comply with all FAA requirements. The extra cost of making the interim state compliant provides no net benefit in the configuration and no commensurate increase in safety.

This interim-state airplane will always be under the control of the Original Equipment Manufacturer (OEM), and as such, the provisions of this exemption are proposed to apply only to the airplane under the control of The Boeing Company.

In the absence of an FAA grant of exemption in this case, significant modifications to all 767-2C airplanes would be required after delivery from the Everett, Washington factory, thus incurring additional and unnecessary costs. These additional modifications also expose each airplane to the possibility of introducing Foreign Object Debris (FOD) or unintentional damage to wiring that could reduce the overall safety and reliability of the airplane. Therefore, it is in the public interest to facilitate The Boeing Company decision to employ the more-efficient design, production, and certification processes on the 767-2C Program.

Statement of No Adverse Effect on Safety

This exemption is limited to 767-2C ATC configuration with the following design features:

STC-provisioned operational switches that can be set to a position that would result in a non-compliant condition:

- six-position rotary switch
- continuously variable switch
- on-off push button switch

STC-provisioned non-operational switches:

- on-off push button switch
- continuously variable switch
- guarded toggle switch
- three-position rotary switch

The airplanes will be operated by Boeing pilots who are thoroughly familiar with these specific features for the short-term purpose of preparing them for the final configuration. The inoperative provisions subject to this exemption are installed to support the follow-on modification by the STC. The functions to be provided by these provisions are not required for civil operation. Therefore, the inoperative nature of these functions has no effect on the airworthiness of the airplane.

Airplane functionality will be set procedurally by the airplane flight manual (AFM), in a fully compliant state throughout all flights subject to this exemption. If the provisioned functionality is inadvertently put into a non-compliant position, the highest failure effect classification for the 767-2C airplane is minor for the ATC. The inoperative provisions subject to this exemption are installed to support the follow-on modification by the STC. If incorrectly set, there would be no impact on airplane operation.

Boeing is provisioning the 767-2C ATC type design with flight deck functionality and switches which support the 767-2C STC. Boeing will provide AFM limitations and INOP placards, where necessary, for the ATC. The STC will complete the certification of the above listed switches in a configuration that will comply with all applicable FAA regulations. As such, Boeing requests relief for the aforementioned regulations to obtain certification of the 767-2C type design provided the airplane remain under the ownership of The Boeing Company.

Federal Register publication

A summary of the petition was published in the *Federal Register* on April 4, 2014 [79 FR 18947]. No comments were received.

The FAA's analysis

The requirements of §§ 25.777(a); 25.1301(a),(b), and (d); and 25.1309(a) and (c) at Amendment 25-46, from which Boeing seeks relief, are primarily intended to prevent flightcrew confusion, inadvertent system operation, and flightcrew errors. The petitioner intends that this relief would only apply to Model 767-2C airplanes while they remain under the petitioner's possession and operation, until the provisions of an approved STC are implemented and the airplanes are returned to a fully compliant configuration. Hence, the airplanes would not be used in service by non-Boeing personnel.

During this temporary period, the FAA considers it very unlikely that Boeing pilots, who are thoroughly familiar with the status and configuration of the switches and buttons, would experience crew confusion, inadvertent system operation, and crew errors, which the rules are intended to prevent. Furthermore, no inadvertent switch position, on-off button selection, or toggle-switch position could result in unsafe system behavior.

The FAA believes that, under these conditions, the additional costs of assembling the 767-2C in a fully compliant ATC configuration (i.e., without exemption), and then modifying the airplanes under the provisions of the approved STC, provides no safety benefit, but would instead incur considerable and unnecessary expense for the petitioner.

If the 767-2C ATC configuration without the STC modifications were to be delivered to and operated by non-Boeing personnel, it is more likely, over the long term, that inadvertent switch and button selections would occur. While such crew errors are unlikely to directly create unsafe system behavior, they are likely to contribute to undue crew confusion, distraction and workload that the regulations are intended to prevent. Therefore, it is essential that no 767-2C be delivered and operated by non-Boeing pilots in the ATC configuration without the STC modifications installed.

As Boeing has proposed, appropriate flight-deck placards and AFM limitations must be part of the ATC configuration until the approved STC modifications are installed.

The FAA's decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest and will not adversely affect the level of safety provided by the regulations. Therefore, pursuant to the authority contained in 49 U.S.C. 40113 and 44701, delegated to me by the Administrator, I grant petition of The Boeing Company for an exemption from 25.777(a); 25.1301(a),(b), and (d); and 25.1309(a) and (c) at Amendment 25-46 of Title 14, Code of Federal Regulations (14 CFR), to permit relief from the requirements to minimize crew confusion regarding the location,

inadvertent operation, functionality, labeling, and design of certain flight-deck controls, buttons, and switches on Boeing Model 767-2C airplanes, with the following conditions and limitations:

1. Placards must be installed to identify inoperative switches and to state that only Boeing company pilots may operate the airplane.

2. The AFM Normal Procedures must address the functionality and proper use of the non-complaint flight deck controls, buttons, and switches to provide pilot understanding of the functionality of the non-complaint flight deck controls, buttons, and switches, and to prevent misuse of them.

3. The following limitation must be included in the airplane flight manual (AFM) for Model 767-2C series airplanes until modified by the STC:

   Only Boeing company pilots may operate this airplane.

Issued in Renton, Washington, on September 19, 2014.

Signed by Jeffrey E. Duven

Jeffrey E. Duven
Manager, Transport Airplane Directorate
Aircraft Certification Service