



**Billing Code 4910-13**

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 25**

**[Docket No. FAA-2019-0294; Special Conditions No. 25-743-SC]**

**Special Conditions: Mitsubishi Aircraft Corporation Model MRJ-200 Airplane; Control Surface Position Awareness**

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

**ACTION:** Final special conditions; request for comments.

**SUMMARY:** These special conditions are issued for the Mitsubishi Aircraft Corporation (Mitsubishi) Model MRJ-200 airplane. This airplane will have a novel or unusual design feature when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. This design feature is a fly-by-wire electronic flight control system and no direct coupling from cockpit controller to control surface. 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:** This action is effective on Mitsubishi on [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Send comments on or before [INSERT DATE 45 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** Send comments identified by Docket No. FAA-2019-0294 using any of the following methods:

- *Federal eRegulations Portal:* Go to <http://www.regulations.gov/> and follow the online instructions for sending your comments electronically.
- *Mail:* Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE., Room W12-140, West Building Ground Floor, Washington, DC, 20590-0001.
- *Hand Delivery or Courier:* Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- *Fax:* Fax comments to Docket Operations at 202-493-2251.

*Privacy:* The FAA will post all comments it receives, without change, to <http://www.regulations.gov/>, including any personal information the commenter provides. Using the search function of the docket Web site, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the *Federal Register* published on April 11, 2000 (65 FR 19477-19478).

*Docket:* Background documents or comments received may be read at <http://www.regulations.gov/> at any time. Follow the online instructions for accessing the docket or go to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Joe Jacobsen, Airplane & Flight Crew Interface Section, AIR-671, Transport Standards Branch, Policy and Innovation Division, Aircraft Certification Service, Federal Aviation Administration, 2200 South 216th Street, Des Moines, Washington 98198; telephone and fax 206-231-3158; e-mail [Joe.Jacobsen@faa.gov](mailto:Joe.Jacobsen@faa.gov).

**SUPPLEMENTARY INFORMATION:** The substance of these special conditions has been published in the *Federal Register* for public comment in several prior instances with no substantive comments received. Therefore, the FAA has determined that prior public notice and comment are unnecessary, and finds that, for the same reason, good cause exists for adopting these special conditions upon publication in the *Federal Register*.

### **Comments Invited**

We invite interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

We will consider all comments we receive by the closing date for comments. We may change these special conditions based on the comments we receive.

### **Background**

On August 19, 2009, Mitsubishi applied for a type certificate for their new Model MRJ-200 airplane. The Model MRJ-200 airplane is a low-wing, conventional-tail design with two wing-mounted turbofan engines. The airplane is equipped with an electronic flight-control system, has seating for 92 passengers and a maximum takeoff weight of 98,767 lbs.

## **Type Certification Basis**

Under the provisions of title 14, Code of Federal Regulations (14 CFR) 21.17, Mitsubishi must show that the Model MRJ-200 airplane meets the applicable provisions of part 25, as amended by Amendments 25-1 through 25-141; part 36, as amended by Amendments 36-1 through 36-30; and part 34, as amended by Amendments 34-1 through the amendment effective at the time of design approval.

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 Mitsubishi Model MRJ-200 airplane because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 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, these special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the Mitsubishi Model MRJ-200 airplane must comply with the vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36.

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

## **Novel or Unusual Design Features**

The Mitsubishi Model MRJ-200 airplane will incorporate the following novel or unusual design features:

This design feature is a fly-by-wire electronic flight control system and no direct coupling from cockpit controller to control surface. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature.

## **Discussion**

As a result of the electronic flight control system and lack of direct coupling from the cockpit controller to the control surface, the pilot is not aware of the actual control surface position. Some unusual flight conditions, arising from atmospheric conditions and/or airplane or engine failures, may result in full or nearly full surface deflection. Unless the flightcrew is made aware of excessive deflection or impending control surface limiting, piloted or auto-flight system control of the airplane might be inadvertently continued in such a manner to cause loss of control or other unsafe stability or performance characteristics.

These special conditions for control surface awareness require suitable flight control position annunciation to be provided to the flightcrew when a flight condition exists in which nearly full surface authority (not crew-commanded) is being utilized. Suitability of such a display must take into account that some pilot-demanded maneuvers (e.g., rapid roll) are necessarily associated with intended full performance, which may saturate the surface. Therefore, simple alerting systems, which would function in both intended and unexpected control-limiting situations, must be properly balanced between needed crew awareness and potential nuisance to the flightcrew. A monitoring system that compares airplane motion and surface deflection, and pilot side stick controller (SSC) demand could help reduce nuisance alerting.

These special conditions also address flight control system mode annunciation. Suitable mode annunciation must be provided to the flightcrew for events that significantly change the operating mode of the system but do not merit the classic “failure warning.”

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 Mitsubishi Model MRJ-200 airplane. Should Mitsubishi 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.

### **Conclusion**

This action affects only certain novel or unusual design features on one model of airplanes. It is not a rule of general applicability.

### **List of Subjects in 14 CFR Part 25**

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

### **Authority Citation**

The authority citation for these special conditions is as follows:

**Authority:** 49 U.S.C. 106(f), 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 Mitsubishi Model MRJ-200 airplanes.

### **Control Surface Position Awareness**

1. In addition to the requirements of Title 14 Code of Federal Regulations (14 CFR) 25.143, 25.671, and 25.672, the following requirements apply:
  - a. The system design must ensure that the flightcrew is made suitably aware whenever the primary control means nears the limit of control authority.  
  
Note: The term “suitably aware” indicates annunciations provided to the flightcrew are appropriately balanced between nuisance and that necessary for crew awareness.
  - b. If the design of the flight control system has multiple modes of operation, a means must be provided to indicate to the crew any mode that significantly changes or degrades the normal handling or operational characteristics of the airplane.

Issued in Des Moines, Washington, on April 16, 2019.

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