



U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, D.C. 20591

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JUN 22 2015

Mr. Jonas Bäckstrand
The Swedish Accident Investigation Authority (SHK)
P.O. BOX 12538
SE-102 29 Stockholm
Sweden

Dear Mr. Bäckstrand:

This is the final response to Safety Recommendations 12.189 and 12.190 issued to the Federal Aviation Administration (FAA) on November 14, 2012, by the Swedish Accident Investigation Authority, *Statens haverikommission* (SHK). The SHK issued these recommendations following its investigation of an incident that occurred at Skavsta Airport, Södermanland County, Sweden. On April 25, 2011, a Ryanair Boeing 737-800 lost electrical power to the right transfer bus shortly after takeoff. The aircraft returned safely to Skavsta Airport. There were no injuries to the passengers or crew.

12.189. Ensure that Boeing introduces measures so that the logic in the electrical system prevents a transfer bus from losing power as the result of an erroneous status signal from the generator circuit breaker (GCB). (RL 2012:20 R1)

FAA Comment. The FAA's Transport Airplane Directorate (TAD) has been working with Boeing, the airplane manufacturer, to identify the cause of this incident and appropriately address Safety Recommendations 12.189 and 12.190. Boeing conducted electrical power system tests in a laboratory using the same equipment as is installed on Boeing Model 737-600, -700, -800, and -900 series airplanes. The testing results showed that erroneous GCB status signals to the Generator Control Unit (GCU) does not cause a loss of electrical power to the right transfer bus. During the investigation, damaged wires associated with the differential protection function within the GCU were discovered on the accident airplane. In response to this finding, Boeing recreated the GCU wire damage, using the same test equipment, and was able to duplicate the loss of power to the right transfer bus. This test confirmed that the loss of power was due to the damaged GCU wires and not erroneous GCB status signals to the GCU. Based on the investigation findings and results of laboratory testing, we determined electrical power system control logic changes are not necessary.

12.190. Ensure that Boeing investigates whether a revision of the procedure in the Quick Reference Handbook for reconnecting an integrated drive generator can rectify erroneous status signals from the GCB. (RL 2012:20 R2)

FAA Comment. During the testing mentioned above, Boeing used the procedures in the 737 Quick Reference Handbook (QRH) to determine their effectiveness and whether changes should be made for loss of electrical power to a transfer bus. Following the QRH procedures effectively addressed a transfer bus loss of power resulting from failures in the differential protection circuits. Boeing concluded that erroneous GCB status signals did not cause loss of electrical power to the right transfer bus of the accident airplane. The procedures for addressing the loss of electrical power contained in the 737 QRH are appropriate to address the loss of a transfer bus. Therefore, Boeing determined that the current 737 QRH procedures are appropriate and revision is not necessary.

I believe we have effectively addressed FAA Safety Recommendations 12.189 and 12.190 and consider our actions complete.

The FAA would like to thank the Swedish Accident Investigation Authority for submitting FAA Safety Recommendations 12.189 and 12.190 and its continued interest in aviation safety. If you have any questions, or need additional information regarding these safety recommendations, please contact the FAA Safety Recommendations Program staff at 9-AVP-FAA-SafetyRecs@faa.gov. Alternatively, you may contact Mr. Rolf Brockmeyer, AVP-420, at (202) 267-3706.

Sincerely,



602 - Wendell Griffin
Director, Office of Accident Investigation
And Prevention