

proposed AD be revised to read as follows: "Following any * * * modification, perform a one-time test procedure of the modified autopilot." The wording in the proposed AD suggests that two tests are to be done at the same time. The commenter requests this change to clarify the requirements and to avoid unnecessary rework.

The FAA partially agrees. The requirements regarding the autopilot test may be redundant because the Sperry service bulletins already specify testing the unit using test information provided in those service bulletins. However, those same service bulletins note that, "Test information given in this bulletin shall be disregarded when revised Component Maintenance Manuals become available." This note may be misinterpreted to mean the test is not required, so the FAA finds it necessary to clarify the test requirement. The FAA has learned that many operators have already accomplished the modifications and post-modification testing specified in the proposed AD. Therefore, paragraph (c) of the final rule has been revised to clarify this requirement.

Request To Allow Alternative Testing Methods

One operator asserts that a variety of effective methods have been used to verify the new time constants described in the Sperry service bulletins for the test. The commenter suggests that the methods of compliance for paragraph (c) of the proposed AD be broadened to allow the option of "other valid methods." The commenter reports that some of its autopilot units were modified and tested in-house in accordance with established test procedures described in the component maintenance manual. The commenter adds that other autopilot units were purchased already modified in accordance with the procedures described in the Sperry service bulletins. The commenter suggests this change to avoid unnecessary retesting of autopilot units for which the use of the new time constants has already been confirmed.

The FAA agrees with the request for the reasons stated by the commenter. Paragraph (c) of the final rule has been further revised to provide operators this testing option.

Request To Revise Requirements for Spare Parts

One operator requests that paragraph (e) of the proposed AD be either removed from the AD or revised to extend the time allowed for spares modifications and AFM revisions. This

commenter asserts that a minimum of 6 months will be necessary to modify spare parts and revise the AFM.

The FAA partially agrees. The FAA finds that the AFM limitations imposed by this AD will sufficiently ensure safety of an affected airplane until spare parts can be acquired and modified; therefore, allowing additional time to modify spare parts will not compromise safety. However, the FAA does not agree that it is necessary to extend the time by which the AFM revisions must be completed. The basic intent of an AFM revision may be accomplished by inserting a copy of the AD into the AFM; operators should be able to complete this action in a short time. Paragraph (f) of the final rule (paragraph (e) in the proposed AD) has been revised to extend the time by which the installation of unmodified spare parts will be prohibited.

Request To Revise Cost Estimate

Two operators request a revision of the proposed cost estimates. One operator notes that the proposed AD does not address the costs associated with obtaining a master change from Boeing to eliminate the need for a middle marker to begin second-stage gain programming. One operator notes that the proposed AD does not address the costs associated with airplane diversions that would result if category II approaches are prohibited at airports without middle markers.

The FAA partially agrees. Since category II approaches are prohibited at airports that do not have middle markers, an operator may elect to fly category I or manual approaches, divert to another airport, or modify the autopilot to operate with radio-altimeter-based gain schedule with control law that does not depend on the middle marker signal. However, the middle marker signal has always been and remains a necessary part of the autopilot that is programmed with a time-based gain schedule. This AD in part is intended to ensure the safe operation of an airplane—within the original autopilot design constraints associated with use of middle markers—by way of operational requirements. No change to the final rule is necessary in this regard.

Request To Revise Parts Cost Estimate

One operator asserts that the parts cost to modify each SP-150 autopilot is \$641—not \$168 as stated in the proposed AD.

According to updated information provided by Boeing to the FAA, the parts cost is \$522 for the SP-50 autopilot and \$620 for the SP-150

autopilot. The Cost Impact section of the final rule has been revised accordingly.

Request To Reactivate Middle Markers

The proposed AFM revision requirement would prohibit a category II autopilot coupled ILS approach when the middle marker is inoperative. One operator suggests that the FAA reactivate middle markers as an alternative to the AFM revision requirement. The commenter claims that the FAA has deactivated ground-based middle marker beacons, and some operators have maintained their airborne marker beacon systems.

The FAA does not agree with the request. The use of the middle marker is an original design feature of the subject autopilots. If the middle marker is inoperative or nonexistent, these autopilots—which are time-based—will not work properly. The FAA has approved autopilots that do not rely on marker beacons. Furthermore, the FAA currently is not considering reactivating the marker beacon system due to the International Civil Aviation Organization's September 1984 revision to Annex 10, which expanded the use of ILS/distance measuring equipment (DME) as a substitute for all or part of the marker beacon system. No change to the final rule is necessary in this regard.

Request To Revise Cause of Unsafe Condition

Boeing requests a change to the second sentence of the Discussion section of the proposed AD. Specifically, this commenter requests that the revised sentence read as follows: "The approach was normal until the airplane passed through 200 feet above ground level, where the airplane, responding to a [glideslope] beam anomaly, started a pitch oscillation that continued to increase." The FAA infers that the commenter is suggesting that the glideslope beam anomaly contributes to the pitch oscillation problem.

The FAA does not agree with the request, but agrees that the glideslope beam anomaly can contribute to the pitch oscillation problem, and may have been a contributing factor to the accident described in the proposed AD. However, there were no indications that a glideslope anomaly contributed directly to the accident. Numerous runway 14R records dating from a time prior to the accident indicate no glideslope deviations or other ILS-related problems. The results of normal and special flight checks of the ILS were also within normal limits. Furthermore, results of simulator testing using typical glideslope profiles have indicated that