

The FAA does not agree. The vibration monitoring system has detected imminent failures of LP compressor shaft location bearing failures in the past. However, bearing and shaft failures have occurred, suggesting that flight crew reaction time due to workload or other circumstances have rendered vibration monitoring only partially effective. Therefore, no change is made to the final rule.

#### **Clarification of Actions in Discussion**

Lockheed Martin requests that the second sentence in the third paragraph of the proposal discussion be changed to read "Those actions must be done so that the installation of the HSGB overheat detector system and installation of the LP compressor shaft extreme axial movement detector system into the engine turbine cooling air overheat monitoring system are complete." Lockheed Martin states that this change clarifies that the modification adds the HSGB overheat detection system in series with the engine turbine cooling air overheat monitoring system. The sentence as-written in the proposal incorrectly states to require installation of an engine turbine air temperature monitoring system.

The FAA agrees and has changed the supplementary information paragraph, which is where this information appears in the final rule, accordingly.

#### **Clarification of Service Bulletin (SB) Lockheed Martin SB 093-77-059 Description**

Lockheed Martin requests that the fifth service bulletin listed under Manufacturer's Service Information in the proposal be changed to read "Lockheed Martin SB 093-77-059, Revision 2, dated April 11, 2002, which introduces modifications to the airplane instrument panels and consoles, necessary for compatibility with the installation of the HSGB overheat detector system and installation of the LP compressor shaft extreme axial movement detector system into the engine turbine cooling air overheat monitoring system." The commenter states that this change clarifies that the modification adds the HSGB overheat detection system in series with the engine turbine cooling air overheat monitoring system. The sentence as-written in the proposal incorrectly states to require installation of an engine turbine air temperature monitoring system.

The FAA agrees. However, because SB 093-77-060, Revision 1, dated June 30, 2003, replaces SB 093-77-059 in its

entirety, all references to SB 093-77-059 are deleted from the final rule.

#### **Clarification of Lockheed Martin SB 093-77-060 Description**

Lockheed Martin requests that the sixth service bulletin listed under Manufacturer's Service Information in the proposal be changed to read "Lockheed Martin SB 093-77-060, dated April 11, 2002, which introduces modifications to the airplane instrument panels and consoles, necessary for compatibility with the installation of Lockheed Martin SB 093-77-059 and the LP compressor shaft extreme axial movement detector system into the engine turbine cooling air overheat monitoring system." The commenter states that this change is needed to clarify that the modification is necessary for compatibility with SB 093-77-059 and the LP compressor shaft extreme axial movement detector system into the engine turbine cooling air overheat monitoring system.

The FAA agrees. However, because SB 093-77-060, Revision 1, dated June 30, 2003, replaces SB 093-77-059 in its entirety, all references to SB 093-77-059 are deleted from the final rule.

#### **Clarification of First Requirement Listed in the Proposal**

Lockheed Martin requests that the first requirement listed in the proposal under proposed requirements of this AD, be changed to read: "Modifications of the engine turbine cooling air overheat monitoring panel at the flight engineer/second officer's console, pilot's caution and warning light panel on the main instrument panel." The commenter states that this change is needed to clarify that the panel is the engine turbine cooling air overheat monitoring panel.

The FAA agrees and has changed the summary, which is where this information appears in the final rule, accordingly.

#### **Clarification of Second Requirement Listed in the Proposal**

Lockheed Martin requests that the second requirement listed in the proposal under proposed requirements of this AD, be changed to read "Installation of an HSGB overheat detector system." The commenter states that the existing second proposed requirement is referencing a system that already exists on the airplane.

The FAA agrees and has changed the summary, which is where this information appears in the final rule, accordingly.

#### **Changes to Economic Analysis**

Lockheed Martin requests that the economic analysis be changed to reflect that instead of one engine requiring a speed probe loom electrical support assembly part number FW15212, ten engines require this part, and to reflect that the total cost of the AD to U.S. operators is estimated to be \$19,996,560.

The FAA agrees and has made these changes in the economic analysis in the AD.

#### **Delete Compliance Paragraph (a)(2)**

Lockheed Martin requests that paragraph (a)(2) be deleted from the AD. The commenter states that Lockheed Martin SB 093-77-059 will be reconfigured when complying with Lockheed Martin SB 093-77-060.

The FAA agrees. SB 093-77-060, Revision 1, dated June 30, 2003, replaces SB 093-77-059 in its entirety, and therefore, paragraph (a)(2) is not required. Paragraph (a)(2) has been deleted and the following substeps have been relettered in the final rule.

#### **Change Wording in Compliance Paragraph (a)(5)**

Lockheed Martin requests that proposal paragraph (a)(5) be changed to read: "Modify airplane instrument panels and consoles with the installation of the engine failure indicators, failure lenses, and marker, in accordance with Lockheed Martin SB 093-77-060, dated April 11, 2002. The commenter states that this change provides clarity on how the panels and consoles are modified.

The FAA agrees and has changed the affected paragraph by referencing SB 093-77-060, Revision 1, dated June 30, 2003.

After careful review of the available data, including the comments noted above, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes described previously.

#### **Economic Analysis**

There are approximately 492 engines and 164 airplanes of the affected design in the worldwide fleet. The FAA estimates that 270 engines installed on 90 airplanes of U.S. registry would be affected by this AD. The FAA estimates that it would take approximately 40 work hours per engine to accomplish the actions, and that the average labor rate is \$60 per work hour. Required parts would cost approximately \$58,956 per engine. The FAA estimates that it would cost approximately \$37,920 per airplane to do the airframe panel modifications. In addition, ten airplanes of U.S. registry would require speed