F-35 Team Looks To Next Milestones Following Preliminary Design Review

A successful Preliminary Design Review (PDR) has the Lockheed Martin F-35 Joint Strike Fighter team looking ahead to upcoming milestones while closing out a handful of remaining PDR issues. As with all tactical aircraft programs, the most significant immediate challenge is weight reduction and control.

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The F-35 Air System PDR, a major program milestone in which the government and contractors review progress on each of the F-35's on-board and off-board systems, was held at the company's Fort Worth plant March 24-27. The purpose of PDR is to assess the aircraft's early design in preparation for the next major program milestone, Critical Design Review (CDR), scheduled for spring 2004.

"PDR showed that our preliminary design meets the F-35 Key Performance Parameters, and our balanced design approach achieves present and future F-35 Air System requirements and solutions," said Tom Burbage, executive vice president and general manager of the Lockheed Martin F-35 JSF program.

Rear Adm. Steven L. Enewold, the F-35 deputy program executive officer, added, "We've seen significant design maturation since last year's Air System Requirements Review milestone, and we need similar gains for CDR."

In defining the F-35's overall baseline design, PDR clears the way for the development team, including subcontractors, to enter into the critical design phase and to begin manufacturing long lead-time parts for the first series of development aircraft. The program remains on schedule for CDR in 2004.

While the vast majority of F-35 systems were judged to be progressing as planned, a small number of issues remained open. Some have been resolved since the close of PDR, while engineers continue to work a remaining few.

Two of the open issues were related to volume constraints in the highest- density areas of the fuselage: the weapons bay and engine cavity. Weapons clearances and the routing of wiring/plumbing posed the main challenges. In recent weeks, engineers incorporated configuration adjustments to resolve those issues.

The remaining significant issue involves higher-than-expected preliminary weight estimates of F-35 structural elements. The issue -- mostly attributable to structural arrangement, load paths and design immaturity (owing to the early stage of the program) -- is under intense study.

"Because we're using modern design tools that have identified issues much earlier than in legacy programs, we're able to apply the considerable resources of our international team to resolve these issues much more quickly than before," Burbage said. "And we're doing this without compromising the F-35's performance and without traditional rework. We expect all remaining issues to be closed in the May/June time frame."

Lockheed Martin is developing the F-35 in conjunction with its principal industrial partners, Northrop Grumman and BAE SYSTEMS. Two separate but interchangeable engines are under development by Pratt & Whitney and General Electric. Among the aircraft F-35 will replace are the AV-8B Harrier, A-10, F-16, F/A-18C and United Kingdom's Harrier GR.7 and Sea Harrier.

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