

# Task masters

Boeing teams develop new method to optimize jetliner maintenance intervals—saving airlines money

By Jeff Wood



A modern jetliner is an assembly of tens of thousands of hardware and software parts, all of which must be checked at appropriate intervals to ensure they are functional and properly maintained.

Now, a new statistical analysis technique is helping Boeing maintenance engineers home in on the most effective maintenance intervals—earlier in the service life of an airplane model.

It pinpoints the optimum inspection interval for various maintenance tasks based on statistical analysis of worldwide operator experience with the airplane. This can minimize maintenance costs and increase the time an airplane is

available for revenue-earning flight.

Indeed, after using the analysis to review 777 maintenance schedules, intervals for 68 percent of the jetliner's 7,500-flight-hour checks were increased, 26 percent of task intervals remained the same, 6 percent were shortened, and one task was deemed unnecessary and deleted.

And there is potential application beyond jetliners and Commercial Airplanes.

"A maintenance program is not static," said Brian McLoughlin, a senior manager in Boeing Commercial Aviation Services' Maintenance Engineering organization. "It's designed to incorporate knowledge gained through the entire service life of an airplane model."

Maintenance requirements for new airplanes and systems are based on testing under laboratory conditions and on historical and predictive data. But over time, in-service experience can tell a clearer story.

Boeing works continuously with systems manufacturers, airlines and regulatory agencies to optimize maintenance intervals based on in-service performance experienced by its airplanes around the world.

The new, advanced statistical method, approved by the U.S. Federal Aviation Administration, European Aviation Safety Agency and Transport Canada, was developed by a team of technical

experts from Boeing Commercial Airplanes, Commercial Aviation Services, Boeing Research & Technology, and Information Technology.

"Statistical analysis helps engineers identify historical and emerging performance trends in the fleet," McLoughlin said. "Engineers now can define the point where it costs airlines less to proactively schedule maintenance than to risk encountering an unscheduled maintenance event."

The team is further developing the tool to forecast parts and material needs for scheduled aircraft maintenance visits, commonly known as A, B, C and D checks.

The method could be equally valuable for other aerospace products across the Boeing enterprise, said Geoff Evans, director of Advanced Services for Boeing Commercial Aviation Services and Global Services & Support. Evans' group looks for synergies in product offerings across the company.

"Accurate determination of component service life," Evans noted, "could allow much more effective mission planning for satellites and other autonomous systems." ■

[richard.j.wood@boeing.com](mailto:richard.j.wood@boeing.com)

**PHOTO:** Boeing has developed a new statistical analysis technique that helps airlines minimize maintenance costs and maximize airplane availability. GREG THON/BOEING