Boeing New 737s on Target to Reduce Fleet Maintenance Cost by 15 Percent

When the new Boeing 737 program was launched in 1993, one of the initial goals was to provide further value for customers by reducing maintenance costs by 15 percent. With operators now having compiled three years worth of in-service data, results of early analysis show that operators are beginning to realize the projected 15-percent cost reduction.

Achieving this goal was no easy task, considering the earlier version of the 737 had set the standard for lowest operating costs in its class.

In today's competitive environment, reducing fleet costs is a key issue that directly affects every airline's bottom line. Fleet maintenance costs can range from 10 to 20 percent of total airplane-related operating costs. Since many of the larger airlines have maintenance budgets in excess of $1 billion, the savings can be substantial.

"We want to provide customers with value," said Carolyn Corvi, 737 Airplane Program vice president and general manager. "That means quality products, on-time delivery and in-service performance. The new 737s are clearly demonstrating how they deliver that value to our customers."

When the Maintenance Cost Reduction by Design program began, the team collected data from 21 airlines around the world, then focused on achieving the cost-reduction goal through three main areas - airplane design, an improved scheduled maintenance program, and enhanced maintenance documents and training.

A value-added design philosophy was followed. Essentially, the team made discretionary design changes only if they offered better value to the customer.

The team centered its approached on new digital systems, fewer and more common parts, simplified designs, improved corrosion protection, enhanced fault identification, and better access to parts. Many of the changes were directly attributable to customer inputs.

Design improvements included a new wing with continuous span flaps. The span flaps have 30 percent fewer parts, and the leading-edge panels were designed for easier access by maintenance crews. Another improvement used quick-disconnect line fittings and improved ground support equipment that reduced engine removal time by 50 percent. In one instance, a design improvement to the landing gear assembly reduced brake change time by 30 percent.

"In many cases, a detailed analysis was used to ensure that a 15 percent cost reduction would be realized," Corvi said. "Engineers used three-dimensional computer modeling and human factors for all design work. This approach verified that components could be readily accessed and removed."

These design improvements extended scheduled maintenance intervals or eliminated specific tasks, resulting in lower costs for scheduled airframe maintenance checks, which account for between 18 and 20 percent of the overall maintenance costs. Design improvements to the trailing-edge flap-drive system, air-conditioning packs and the airplane's electrical power system have significantly reduced the scheduled maintenance intervals.

Improved manuals and training also were essential in reaching the 15-percent goal.

New manuals were written to the latest Air Transport Association specifications. The Structural Repair manual was enhanced to include more detailed and user-friendly reports. Boeing made documents available in digital format, and software products such as the Portable Maintenance Aid allowed quick access to data through hyperlinks.

The final element in the process was training. Mechanics now are trained more efficiently by using computer-based training, which is student-paced, revised more frequently, and more interactive.

"Individual airlines' maintenance cost will vary, but I believe that as our customers gain more experience with the airplane, the actual maintenance costs will be even lower than predicted," Corvi said.

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