



GE Engine  
Services

# Service Solutions

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In one of the most aggressive fleet upgrade programs ever, Southwest Airlines has selected GE Engine Services (GEES) to install new, advanced technology cores into 300 of its CFM56-3\* engines. These

we've relied on for nearly 20 years and makes it even more efficient, more economical to operate and easier to maintain.

"GE Engine Services will help ensure that we maximize our investment in this upgrade. The program completely supports Southwest's objec-

## New technology powers up Southwest Airlines' 737 fleet

engines power Southwest's fleet of Boeing 737-300 and -500 aircraft, and the upgrade will provide the

tive of providing highly reliable, low cost service to our customers."

The new core leverages 3-D aero compressor technology developed for the CFM56-7 for the Boeing Next-Generation 737. By incorporating this technology into the CFM56-3, operators gain an additional 15°C in exhaust gas temperature margin, which

translates to longer time on wing, and thus, lower maintenance costs.

The technology also provides as much as a 1% improvement in specific fuel consumption. Improvements to the high pressure turbine include new nozzle, blade and shroud materials, as well as improved cooling.

These changes extend component

life, as well as reduce scrap rates and repair costs.

The upgrade kits will be certified in early 2002 and begin delivery later that year. Southwest's entire fleet upgrade is scheduled for completion by mid-2005.

"We're really looking forward to furthering our relationship with Southwest Airlines," said George Oliver, vice president and general manager of GEES. "It's highly gratifying to have an airline of this stature express continued confidence in our ability to provide consistent, high-quality, cost-effective maintenance."

GEES maintains and overhauls nearly 650 CFM56-3 and CFM56-7 engines for Southwest. The airline signed a five-year extension to its Maintenance Cost Per Hour<sup>SM</sup> (MCPH<sup>SM</sup>) agreement, making GEES its maintenance provider of choice through mid-2012. GEES offers MCPH service contracts at a flat-rate cost per flying-hour to help airlines forecast expenses, manage costs and plan for technical improvements in its maintenance budget.

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Southwest Airlines is launching an upgrade program for its entire 737-300/500 fleet.

engines longer time on wing, better specific fuel consumption and longer component life.

"The CFM56-3 is the backbone of our fleet," said Jim Sokol, vice president of Maintenance and Engineering for Southwest. "This upgrade puts the most advanced technology available into an engine

\*CFM56 engines and the CFM56-3 core upgrade are produced by CFM International, a 50/50 joint company between Snecma Moteurs (France) and General Electric (U.S.)

### Introducing *Service Solutions*

GE Engine Services is pleased to introduce *Service Solutions*. In each bimonthly issue, we'll focus on service technology and solutions designed to benefit you, the customer. Our goal is to provide meaningful information you can use to help your bottom line. We hope you enjoy it in printed or electronic format, and that it becomes a valuable tool for your business. <http://www.geae.com/servicesolutions>

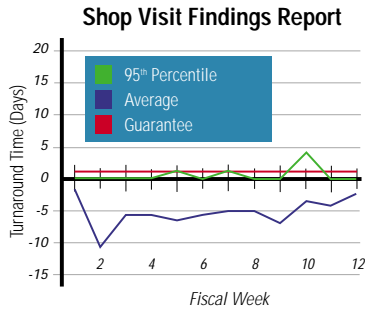


GE Engine Services (GEES) is offering the following overhaul performance guarantees, including customer service guarantees—the first such guarantees available in the industry.

## GEES offers overhaul performance guarantees

### Customer Service Standards:

GE will provide critical overhaul documentation through digital



communications for all GE engines for Time and Materials (T&M) customers. Customers will receive a Communications Package (Engine Receipt Confirmation within one day of receipt; Missing at Incoming Report within five days of engine induction), Shop Visit Findings Report (within one day of engine shipment), Final Records Package (Life Limited Parts Report, Service Bulletin Compliance, Off/On Log, Test Data and Fan Blade Mapping within one day of engine shipment),

Initial Invoice (within three days of engine shipment) and Final Invoice (within 30 days of Initial Invoice). GEES guarantees delivery to these customer service standards or remedies will be provided at the time of issue of the Final Invoice.

A similar program is being offered for T&M sales for JT8D engines. Additionally, the Communications Package, Shop Visit Findings Report and Final Records Package may be offered for MCPH™ customers.

**Overhaul Turnaround Time (TAT):** GEES guarantees that each engine will be returned within the specified time. Leading the industry in TAT on CF6, CFM and JT8D engines, we're working to continuously improve shop performance to be

best-in-class for every shop on every engine line. Lean manufacturing techniques and flow technology are being used in each shop to reduce variation in TAT and improve speed. These best practices enable GEES to guarantee TAT based on predictable shop performance. We stand behind these guarantees with remedies (\$/day missed) in the form of a credit applied to the Final Invoice. **EGT Margin:** Test cell EGT margin guarantees are being offered to demonstrate the quality of our overhaul performance. Depending on the customer's fleet size and shop visit frequency, both single-engine and 10-engine rolling average guarantees are being offered. GEES is incorporating best practices across the overhaul shops to optimize worksopes and improve



predictability in test cell EGT margin. In the event that a guaranteed EGT margin is missed, we provide remedies to ensure complete customer satisfaction.

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The GE Engine Services coating rejuvenation repair process ensures optimal

that cause coating spallation. The resultant extended part life

## Coating rejuvenation extends HPT blade life, reduces cost of ownership

results when High Pressure Turbine (HPT) blades for CFM56-3, CF6-80C Stg. 1 and CF6-50 Stg. 2 engines are repaired. Key benefits of GE's approach include: additional repairs are possible, no residual TBC in holes, no residual corrosion, no realuminiding of internals and control of coating thickness. Other approaches may result in TBC-blocked cooling holes, residual corrosion that peels the coating off, realuminided internals that peel the coating and block holes, and thicker coatings

reduces the customer's cost of ownership. Estimates for coating rejuvenation, based on three shop visits/repair cycles, show that the average savings on a CF6-80C engine is \$25,000 to \$35,000 per shop visit (industry average). GEES analyzes material costs on a per shop visit rather than a repair price basis.

"We recognize that the biggest driver for our customer is cost of ownership, so we're focusing on developing repairs that deliver that for our cus-

tomers," said Bill Millhaem, general manager of GEES Component Repair. Rick Stanley, general manager of Customer Technology Programs, added: "We're providing savings, but also ensuring that the repair has the best possible reliability. We can do this since we have the OEM system data that lets us do comprehensive analysis for the repair design and assess the impact on the entire engine system."

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As received HPT Blade with Thermal Barrier Coating (TBC)



Rejuvenated Blade



We've been listening to you, our customers, and are turning your feedback into new process improvements

and solutions. We're measuring everyone across our business daily on delivering everything we promised... when we promised it...every single time. This extends beyond product delivery to communications/ reports, invoices, responsiveness, quotes/cost estimates, records and product performance.

## GE Engine Services focusing on customer satisfaction across all its businesses

**You asked us to improve communication:** Today, every overhaul, repair and accessories shop is providing the same reports to keep you informed throughout the process—from receipt acknowledgement, engineering findings and cost estimates to a weekly status report. Now, 99%+ of reports are on time with a 92%+ customer satisfaction rating. We've made this functionality available via our Customer Web Center and we're tailoring information to meet your specific needs.

**You asked us to speed up our invoice process:** So we started with the answer—deliver a final, accurate

invoice at shipment in every business, every time. We're virtually eliminating trailing charges by digitizing

cost accumulation and engaging every supplier in helping us achieve this target. In Overhaul, we've eliminated 88% of invoice delivery variation and we're seeing a 40% increase in customer satisfaction. We're now driving to make e-invoicing and invoice net of warranty available.

**You asked us to improve "availability" and responsiveness:** We're making customer support available 24x7 across our shops and On Wing Support; Leasing and Spare Parts businesses through our Customer Support Center. We've "blown up" our issue resolution process, implementing CRM software globally, as well as a new issue escalation process that's driving "daily connectivity" across our business and that's delivered a 2.5x improvement in closure speed. It's not when we say it's resolved, but when you do.

**You asked us to improve cost estimation and quotation:** We're building new Overhaul cost estimation models to

provide 90% accuracy from initial estimate to invoice. Across repair and accessories, we're "wiring" the

functionality needed to provide an accurate quote within days of receiving your repair or accessories. Our repair business is adding new collaborative web functionality to better connect you to Findings Reports, Quotes/Approvals, Parts Tracking and Departures. This isn't simply about speed and accuracy; we're challenging our team to lower your cost of ownership.

Your feedback through 3000+ responses to our customer satisfaction surveys says you're starting to feel the difference. We've only just begun and your feedback continues to focus us on where you say we need to be. We're absolutely committed to customer satisfaction... every day...every business.

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### GE Engine Leasing and Korean Air enter into major leasing deal

GE Engine Leasing (GEEL), a joint services entity of GE Capital Aviation Services (GECAS) and GE Engine Services, entered into a five-year finance lease with Korean Air Lines (Korean Air) for 22 spare aircraft engines. This transaction represents the first engine financing between GEEL and Korean Air. The deal was structured to meet Korean Air's specific financing requirements, and further expands the relationship between GECAS and Korean Air.



"Korean Air is one of GECAS's most valued customers, and we're delighted to provide spare engine financing as the airline expands its fleet and service capacity," said John Abbott, general manager of GE Engine Leasing.

## LRU MCPH<sup>SM</sup> program offers cost advantages



GE Engine Services' new LRU (Line Replaceable Unit) MCPH<sup>SM</sup> (Maintenance Cost Per Hour<sup>SM</sup>) program covers repair costs for flightline removals of eligible LRUs. LRUs are removable, repairable engine and airframe controls/accessories.

Key customer benefits of the program are:

- **Predictable flightline maintenance costs:** The \$/Engine Flight Hour (EFH) rate facilitates activity-based budgeting and reduces purchasing/overhead administration costs, as well as transactional overhead expenses. It also simplifies payables administration.
- **Improved fleet reliability:** GEES assumes reliability risk and is focused on reducing unscheduled removals and LRU-related delays and cancellations. The LRU MCPH program combines GE and component OEM engineering resources to develop optimal repair specifications.
- **Inventory investment reduction:** The program reduces variation and overall span of repair turnaround time.

LRU MCPH program features include:

- GEES Program Manager will serve as a single point of contact for all repair administration
- Overhaul or repair of LRUs to customer specification
- Airworthiness Directive and Advisory Service Bulletin coverage (Levels 1 & 2)
- Transportation to/from the Repair Station
- Warranty administration and recovery
- GE technical resources: repair workscope management, quality systems administration and repair logistics management
- Options: Customized LRU eligibility, on-site logistics manager, 100% scrap replacement/rotable inventory support, combining LRU MCPH with a new or existing engine MCPH contract.

We're committed to providing customized programs for your operations. GE Accessory Services stands ready to serve all of your LRU repair needs.


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View *Service Solutions* online at <http://www.geae.com/servicesolutions>



**GE Engine Services**  
We bring good things to life.

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## Service Solutions

The purpose of *Service Solutions* is to enhance communications with you, our customers. Please contact us if we at GE Engine Services (GEES) can be of further service to you.

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