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GE Engine Services

service solutions

Frontier Selects GE to Maintain Fleet

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Fixed costs and technical expertise key factors

We recently spoke to Ron McClellan, VP Maintenance & Engineering at Denver-based Frontier Airlines, regarding Frontier's choice of GE Engine Services' (GEES) Maintenance Cost Per Hour℠ (MCPH℠) program to maintain their fleet of CFM56-5B-powered A318 and A319* aircraft. The program uses the GEES maintenance network, engineering resources and management expertise to maintain an individual customer's fleet based on a fixed rate per engine flight hour, enabling the customer to forecast operation costs with greater accuracy.

In selecting a maintenance plan for their fleet, Frontier also considered several Time and Material (T&M) programs by evaluating each vendor's average shop visit cost, turn-around times and technical support. GE stood out as the leader with key factors being MCPH's fixed cost budget protection and GEES' materials and parts support.

Technical aspects of the maintenance agreement were negotiated to fit Frontier's current and future operational needs. In addition to owned engines, the MCPH program was tailored to incorporate leased engines, thus removing any obstacles in Frontier meeting leased engine return conditions.

"MCPH fits exactly what we were looking for," said McClellan. "Handling leased and owned aircraft in one program, we have flexibility to move engines around. It makes our engine program seamless from a leased engine vs. owned engine perspective."

To further customize the contract, Frontier added service bulletin and life limited parts (LLP) coverage maintenance options. These additional options enable Frontier to support two new aircraft fleets without additional staff, which is important to them. "We can rely on GE to manage these technical items for us," McClellan said.

McClellan also gives high marks to the MCPH program's financial and technical support benefits. "With the establishment of a fixed hourly maintenance cost, current and future cash flows are much more favorable and easier to project on a monthly basis." From a technical standpoint, the MCPH agreement provides more reliable technical support, including the use of GEES' On Wing Support℠ and offers key protection from unscheduled or numerous shop visits.

"In the current airline environment, we need to protect our cash flow," said McClellan. "Selecting the MCPH program, with the On Wing Support, will help to keep engines on wing, thus generating more revenue. The new arrangement with GE should be a win-win for the companies."

Maintenance and restoration work will be conducted at GE's Strother Field facility near Arkansas City, Kansas.

This is the fourth in a series of articles about the capabilities of Unison Industries.

Unison Provides Turbine and Piston Engine Ignition Systems

Broadest product line in the industry supports both markets

Unison Industries, the world's leading manufacturer of turbine aircraft ignition systems, is also the leading manufacturer of piston engine ignition systems. With products on virtually every piston aircraft engine, Unison has the broadest product line in the industry. Unison's ignition system components for piston engines include Slick magnetos, Slick ignition harnesses, Autolite® Aviation Spark Plugs and SlickSTART™ magneto start boosters.

The major components of a piston engine ignition system are the magnetos, ignition harnesses and spark plugs. Typically, a piston engine has two magnetos installed for redundancy. As the engine spins, the magnetos generate electricity that is distributed via a distributor block to the ignition harness. The ignition harness transfers the energy generated by the magnetos to the spark plugs via a coiled center conductor, limiting radiated electromagnetic interference. The spark plugs then deliver the energy from the ignition harness to the combustion chamber where the spark ignites the air/fuel mixture.

Educated pilots, aircraft owners and mechanics demand Autolite Aviation Spark Plugs for superior transfer and leakage protection, increased reliability, long life and cost-effectiveness. Unison's spark plugs are PAA-PMA approved and available for almost all piston engine models.

Since their reintroduction into the general aviation market in 1999, companies depend upon Autolite Aviation Spark Plugs. Customers such as Van's Aircraft, a well-respected aircraft kit manufacturer, and Northern Air Cargo, the world's largest operator of DC-6 aircraft and the largest Alaska-based air cargo carrier, have switched to Autolite Aviation Spark Plugs.

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Service for CF34 Engines Now Global

Three new providers join GE's service network

Owners of CF34* turbofan engines now have three additional GE authorized service providers to turn to for their maintenance needs. In addition to GE Engine Services' (GEES) CF34 overhaul facility located at Strother Field, Kansas, GE recently added Standard Aero, MTU Maintenance and IHI to its global GE Branded Service Agreement (GBSA) network.

Standard Aero, located in Winnipeg, Canada, was the first GBSA authorized CF34 service provider to enter the market. Eleven months after signing the GBSA contract with GE, the newly built shop solely dedicated to servicing CF34 engines attained production ready status. Standard Aero has recently completed service work for several CF34-1 and CF34-3 business and regional jet operators and has plans to introduce initial CF34-8C capability later this year.

Crossing over to Berlin-Brandenburg, Germany, MTU Maintenance's new CF34 overhaul and repair center received full FAA certification following test cell correlation in December 2002. The facility is now production ready for an overhaul of all CF34-1 and -3 engine models, including business jet and regional jet applications. The shop's first two customer engines were recently completed with exceptional performance and turnaround time. MTU Maintenance is targeting CF34-8C introduction later this year.

A third partner on the GBSA program is also online. Located in Tokyo, Japan, IHI is the only authorized CF34 service provider in Asia. The shop recently received full FAA certification and has already contracted its first customer engine for immediate induction. In addition, as a current CF34-8C revenue share partner with GE, IHI is planning an accelerated introduction of CF34-8C service capability as well.

"GE is very proud to have such a high quality network of authorized CF34 service providers," said Dan Heintzelman, President, GEES. "It enables operators with a greater choice of service providers, located closer to where they operate, while still providing the highest standards of quality and technology per GE standards."

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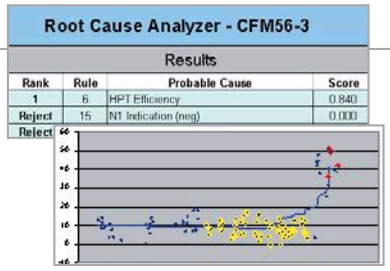

eTrend Fleet Alarm Manager Live, Root Cause Analyzer On the Way

Expanded functionality enables customers to more effectively monitor engine health

Reduce delays, increase time on wing, reduce unscheduled engine removals. The list of goals goes on and on for airline organizations trying to reduce the cost of fleet ownership. Now, those goals are more easily attainable thanks to some significant enhancements to eTrend from GE Engine Services (GEES).

The eTrend product brings together the critical engine operational data to enable analysis and reporting. Initially launched on the GE Customer Web Center (CWC) with three main offerings—FleetVue, QuickPlot and DataAnalyst—eTrend has grown in popularity as a "must have" for airline in-house fleet management. "We now have 16 airlines utilizing eTrend to manage their fleets," said Chris Henlein, remote diagnostics business leader, GEES. "For those airlines that manage fleets in-house, it has become an invaluable tool."

To provide additional value, Fleet Alarm Manager was introduced in January 2003. This product enhancement allows airlines to view all engine alarms, associated plots and historical information to enable effective alarm disposition. With this capability, more informed decisions can be made regarding whether an engine should be put "on watch" or marked for maintenance. In addition, enhanced anomaly detection technology has been added to more accurately identify potential engine problems in a timely manner.

Another eTrend enhancement coming soon is Root Cause Analyzer. Scheduled for roll out in the fall of 2003, Root Cause Analyzer automatically calculates shifts in engine parameters and determines probable root cause based on adaptive fuzzy logic. "The eTrend service product is constantly evolving," said Henlein. "As more of our customers use the service, we'll be able to identify additional tools to assist them in managing their fleets."

Interactive automated report generation is another enhancement in development. The eTrend team is currently refining that functionality and anticipates availability in early 2004.

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GEAE Launches Education Site to Teach Jet Engine Basics

Robust content to provide overview of what GE Aircraft Engines is all about

GE Aircraft Engines (GEAE) has launched an interactive Web site to teach visitors how jet engines work. It is accessible through the company site at www.geae.com.

"This is a fantastic way for the public to learn what we are all about," said Dave Calhoun, president and CEO of GEAE. "As part of GE's continuing commitment to education, the site will continue to expand with materials that professors and teachers can use to teach tomorrow's aviation leaders."

The site, with video and text overviews, features segments on: how jet engines work, safety, environment and historical innovations. For example, an interactive simulator shows what happens to an engine during takeoff and landing. With passenger safety and engine reliability at GE's forefront, the site informs visitors about the intensive rigors every engine must undergo. Details pertaining to GE's environment friendly initiatives are shared. And the site also provides a trip through the company's aviation history with an outlook on what is being studied for the future.

"If you ever wanted to learn more about jet engines, this is the place," said Calhoun.

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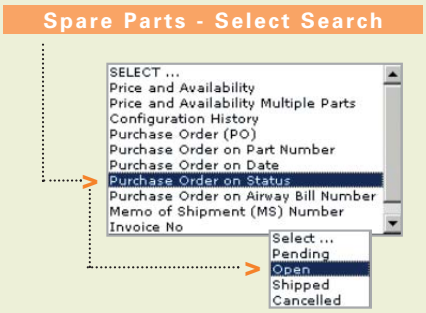
CWC > productivity tip

When is my order going to ship?



> You can find out the shipment status of every purchase order through the Customer Web Center (CWC). CWC users can find the information by using the "search" feature under "Spare Parts" and selecting "purchase order on status."

You can then select from "pending," "open," "shipped" or "cancelled" orders for the time period you desire.

After viewing, you can download the results to a data file.

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Bob Kissinger, Manager-Repair Engineering Operations, GEAE

Global Component Repair Symposiums Educate Customers

Attendees learn how to reduce engine cost of ownership

GE Engine Services Repair Engineering group and services partner ATI teamed to deliver three global customer-technology symposiums. The thrust of each conference was to expose customers to GE Aircraft Engines' (GEAE) newest component repair capabilities, technology infusion programs and service-based solutions, all in an effort to drive down engine cost of ownership. The symposiums were held in Cincinnati, China and Singapore during February and March 2003.

With more than 130 attendees, participants included representatives from 55 different airlines, chief engineers from four international air carriers, MRO managers from all levels of operation and FAA administrators.

"One of our goals was to provide our customers with a direct link to our Repair Engineering team and listen to the individual needs of our customers," said Russ St. John, marketing director, GEAE MRO Operations. "We want to be a resource in helping them reduce operational disruptions and drive down total cost of ownership."

Detailed repair methodology was provided on specific hardware, structures and rotating parts. Additionally, service-based solutions designed to further reduce customer cost of ownership—namely GE's Speed Cell, in-flight diagnostics and digital imaging technologies—were discussed.

"The focus of our presentations was to convey the inherent value of the OEM repair and stress our system-wide approach to developing such repairs," said Bob Kissinger, manager, GEAE, Repair Engineering Operations.

Detailed discussions of GEAE's new product introduction processes, validation protocol for new repairs and the corresponding direct and indirect effects these repairs can have on the engine were all focal points of the material presented. Individual breakout sessions were held at the conclusion of each conference to provide customers with the opportunity to address specific questions and issues about maintaining their fleet of GE engines.

The Materials Marketing team is currently working to deliver the same message and content to GEAE's military customers in the coming months.

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

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