

## CFM Launches TRUEngine Program

CFM International has launched the TRUEngine\* designation to help the industry more accurately appraise used CFM56\* engines and to enhance the resale value of these assets.

"The industry has asked CFM for better ways to determine the value of engines as they are redistributed in aircraft fleets," says Eric Bachelet, president and CEO of CFM International. "The TRUEngine program allows customers to more easily evaluate used CFM56 engines by serial number, based on data currently not widely accessible."

### TRUEngine™

Continental Airlines (more than 500 CFM56-3 and CFM56-7B engines), KLM Royal Dutch Airlines (more than 115 CFM56-3 and CFM56-7B engines) and Southwest Airlines (more than 1,100 CFM56-3 and CFM56-7B engines) are the first CFM customers to achieve the TRUEngine designation for their CFM56 engines.

### Stringent Criteria

Based on a comprehensive review of airlines' fleet operational data and maintenance records, the TRUEngine designation is available to all CFM56 engines meeting the program's objective criteria.

To qualify for TRUEngine status, an engine's configuration—and the overhaul practices and spare parts and repairs used to

service the engine—must be consistent with CFM\* requirements for that engine model. In addition, all maintenance must comply with CFM-issued engine manuals and maintenance recommendations.

Says Continental Staff Vice President-Fleet Management Ron Baur, "The TRUEngine program helps us protect our investment in our CFM56 engines. We are in the midst of one of the most challenging times in our industry's history, and operators worldwide are looking for ways to reduce costs.

"As we work to reduce capacity by divesting our older 737-300 and 737-500 aircraft," says Baur, "we believe the TRUEngine status of our CFM56-3 engines makes the engines more marketable and helps us achieve a higher resale value."

### Why TRUEngine?

Commercial jet engines are typically in service for more than 25 years and change ownership at least once in their operational lives. An engine's configuration, material content, maintenance history and supportability impact overall value as it changes ownership.

The TRUEngine program has been embraced by several of the industry's leading asset valuation providers, including Ascend, AVITAS and the International Bureau of Aviation (IBA).

"Access to the data provided by the TRUEngine program is great news for the industry," says Gehan Talwate, managing director of Ascend. "Having CFM confirm that the engines have been maintained to the original manufacturer's standards will help

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### TRUEngine Quick Facts

- Indicates an engine contains CFM-approved parts and repairs
- Is assigned by individual engine serial number, not by fleet or operator
- Is based on records review
- Remains in effect until new data is available or until the next shop visit
- Helps appraisers, operators and purchasers understand an engine's material content
- Facilitates CFM's ability to provide technical product support



## Lowering Costs, Saving Fuel

# GE Flight Operations: Pilot-to-Pilot Support

More than a quarter of a century ago, GE Aviation took the industry lead in providing operational support to pilots by pilots. It remains today a normal course of doing business. As part of the GE Customer and Product Support Organization, the Flight Operations Support team serves as a continuous interface with operators of GE and CFM International engines, aircraft manufacturers, GE's internal engine experts and regulatory agencies.

"Airline management is fully involved in engine choice," says Capt. John Gough, director, Flight Operations Support. "But, from there on out, 99% of engine operating time is in the hands of flight crews. Bottom line: When dealing with flight ops, you need pilots talking to pilots—and that is what our team delivers to GE's customers."

## Reducing Fuel Consumption

High on every organization's flight ops list: managing fuel consumption. "Fuel costs are escalating vertically, and that has affected all operators," says Gough. "The vice president of Flight Operations at a major U.S. airline recently told me, 'For my organization, I can't even consider overhaul costs or other such things because, with the current price of a barrel of oil, if I don't start controlling how much fuel we burn, my airline won't be here when it is time for the engines to go into overhaul.'"

## Field Report

### Study Leads to Millions in Savings

**GE's Flight Operations Support team recently worked with a carrier operating CF34\* engines. Following analysis and implementation, the customer will realize significant savings and increase the life of its engines.**

**Situation:** At the time Flight Ops first met with the airline community, the airline was not employing derated takeoffs and did not want

## The Flight Ops File

Last year, GE's Flight Operations Support team worked with flight operations communities at about 85 GE and CFM International customers, and this year the team is on track for 100.

Flight Ops' pilot team can train customers' flight crews in several areas of opportunity to lower costs of ownership and promote fuel conservation, including:

- Power management
- Exhaust Gas Temperature (EGT) margin
- Use of reduced thrust takeoffs
- Normal versus derated climb
- Best practices for efficient operation of GE and CFM engines
- Engine warm-up and cool-down times and how they relate to use of engine-out taxi and use of idle reverse thrust as a form of fuel savings



*"Operators' number one concern is always safety. But, from a financial standpoint, right now it is, 'Whatever we can do to reduce fuel costs.'"*

—Capt. John Gough

"As the primary contributors to engine health and time between shop visits, flight crews are the single largest influence on an engine's operation," says Gough. He notes the direct corollary between fuel burn and engine life. "As an engine ages, it burns more fuel. However, by employing various best practices, pilots can prolong engine life and help prevent the increase in fuel burn."

## Studying Fuel Burn

"Operators' number one concern is always safety," emphasizes Gough. "But, from a financial standpoint, right now it is, 'Whatever we can do to reduce fuel costs.'"

In response to this business reality, GE formed a Fuel Burn Cluster Group as part of the company's "At the Customer, for the Customer" (ACFC) initiative, which studied the issue from every angle—working on new engine technologies, improved maintenance practices and other operational considerations to aid engineering, maintenance and flight crews in optimizing the use of their engines.

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## Entry Into Service Flight 'First Class'

# GP7200-Powered A380 Enters Service August 1

Twelve years of collaboration between GE Aviation and Pratt & Whitney culminated in the Engine Alliance's GP7200\* engine's entry into service on August 1. On that date, the first GP7200-powered Airbus A380\* made its maiden passenger-carrying journey with launch customer Emirates' 13-and-a-half hour non-stop flight from Dubai to New York City.

This milestone marks the first Engine Alliance-powered aircraft to enter revenue service since the partnership was formed in 1996 to design and manufacture the powerplant for the A380 super jumbojet. In 2000, Emirates became the first airline to sign a firm commitment for A380s, and with 57 more on order, the carrier will have the world's most expansive fleet of this aircraft.

## Peerless Fuel Economy

The aircraft is powered by four Engine Alliance GP7200 engines delivering up to 70,000 lbs. of thrust each. With an overall fuel efficiency of only three liters of fuel per passenger per 100 kilometers, by some estimates, the GP7200 offers better fuel economy per passenger kilometer than most hybrid passenger cars.



© Airbus S.A.S. 2008 photo by e'm company/H. Groussé

The Middle East carrier received its first aircraft during an historic delivery ceremony at Airbus' Hamburg, Germany, facility on July 28. At the ceremony, HH Sheikh Ahmed bin Saeed Al-Maktoum, Chairman & Chief Executive,

Emirates Airline and Group, said: "Emirates will offer the lowest fuel consumption per passenger of any A380 or other aircraft in the skies. Ladies and gentlemen, the future has arrived, and we at Emirates are very proud to be playing a leading role in it."

Says Engine Alliance President Jim Moravec, "We are delighted that the world's largest A380 fleet will be powered by the GP7200 engine—the quietest, most fuel efficient engine for the A380. We are excited to deliver this value to our customers beginning with this first GP7200-powered aircraft for Emirates."

## World-class Service and Support

"The entry into service marks an important milestone for Emirates, Airbus and the Engine Alliance," says Ed Bendernagel, director, Product Support for the Engine Alliance. "We're excited to begin the operational phase of the GP7200 engine program, and we're ready to provide world-class support to Emirates and our other customers."

The Engine Alliance-designated GP7200 engine overhaul shop is GE's Services facility in Cardiff, Wales, which has been preparing for the engine's entry into service for more than three

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Visitors to this year's Farnborough Air Show enjoyed seeing Engine 001—the GP7200's first engine to test—which first ran in March 2004 and went through more than 500 hours of rigorous ground testing.

# Deals, Updates and OnPoint Solutions Signings

## Farnborough Air Show Roundup

GE Aviation and CFM International inked several agreements during this summer's Farnborough Air Show, including:

### **Atlas Air Worldwide Holdings, Inc. (AAWW):**

AAWW has ordered GE's Tech CF6\* upgrade kits for the CF6-80C2 engines that power its Boeing 747-400F fleet. The upgrade kits will enable the company to enhance the reliability and cost efficiency of the engines serving its 747-400F fleet. AAWW is the parent company of Atlas Air, Inc. and the majority shareholder of Polar Air Cargo Worldwide, Inc., which together operate the world's largest fleet of Boeing 747\* freighter aircraft.

### **Ryanair OnPoint\* services extension:**

European low fares airline Ryanair has signed a multiple-year extension of its GE OnPoint solution agreement with GE Aviation's Services business. The agreement covers Ryanair's CFM56-7B engines and now includes all current firm and option engines on order by the airline. In addition, the agreement expands the OnPoint services coverage to include the carrier's new Tech Insertion engines, which provide reduced fuel burn and lower emissions.

"The OnPoint program has enabled us to significantly reduce the maintenance and overhaul costs for our CFM56-7B engine fleet," says Michael Hickey, Ryanair director of engineering. "This extension now takes that relationship even further into the future. It puts Ryanair in a great position going forward because we know exactly what our costs are going to be."

### **Singapore Technologies Aerospace Ltd.**

**(ST Aerospace):** GE and ST Aerospace signed a global cooperation agreement in support of the business' CFM56-3, CFM56-5B and CFM56-7B engine maintenance, repair and overhaul (MRO) operations. In addition, CFM International inked a comprehensive 10-year materials services agreement that encompasses component repairs and the provision of both new and used serviceable materials for life-limited and non-life-limited parts for the CFM56 engine.



**Southwest Airlines:** Southwest has signed a 10-year OnPoint solution agreement for the maintenance and overhaul of all its current and future CFM56-7B engines. This agreement will cover more than 660 engines currently in operation at the airline and an additional 200 engines on order. Under the OnPoint agreement, the carrier will receive long-term cost-effective, comprehensive, low-risk support and services that will enable Southwest to more accurately predict its operating costs.

### **Air Canada Technical Services (ACTS):**

Announced in the days following the air show, Montreal, Canada-based ACTS and GE have signed a Memorandum of Understanding announcing that the ACTS Engine Maintenance Centre (EMC) is a GE fulfillment center for CFM\* Small Fleet Operators. ACTS will serve as the fulfillment center for engine repair, overhauls and on wing and diagnostic services for select operators of the CFM56-2/-3/-5A and -5C located in the Americas.

"GE is excited to work with ACTS on the small fleet strategy," says Jacques Chausse, general manager of Services Marketing at GE Aviation. "ACTS is committed to bringing superior service levels expected by GE customers. Additionally, ACTS can provide the airline expertise to aid in fleet operations."

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## Did You Know?

Leading appraisers typically place 13-15% higher value<sup>1</sup> on CFM56-3 engines that only contain CFM\*-approved content. This equates to more than \$400,000 in resale value for an average CFM56-3B2 on the used market.

Gough also points out that the added benefit beyond fuel savings is the related CO<sub>2</sub> emissions savings. “Fuel and CO<sub>2</sub> are directly tied together, so when you save fuel, you’re emitting less CO<sub>2</sub>. And as a greenhouse gas likely to be regulated, CO<sub>2</sub> is something many airlines may be paying for in the near future.”

The synergy of Flight Ops’ “GE pilot-to-customer pilot” connection has provided the study group with invaluable information on engine performance in various operating situations.

### 100-plus Years Piloting Experience

The Flight Ops team is uniquely qualified to

both serve as the voice of GE and as the voice of operators, providing an opportunity for a two-way dialogue that benefits all parties involved. Team members bring to the table a combined 109 years piloting experience—more than 37,000 flight hours—and type ratings for all GE and CFM\* engines. In addition to piloting military and commercial aircraft, the team’s multifaceted résumé includes flight test, pilot instruction, flight standards evaluator and engineering program management experience.

The team’s extensive real-life operational expertise ensures a reliable conduit between GE and its customers. Explains Gough, “We serve as

subject matter experts, develop training manuals and provide pilot-to-pilot training in flight deck systems. Occasionally, we conduct operational reviews—sometimes through jump seat observations—and help implement best practices.

“In all we do, Flight Ops’ ultimate goal is to do our part to deliver GE and CFM engines that are flight crew friendly from entry into service to final flight,” says Gough.

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years. “The GE Wales team’s high level of readiness is critical to the GP7200 program,” says Chuck Geiger, Engine Alliance services leader. “They have the publications, tooling and training to service these engines from first flight on. A robust shop-readiness plan is in place and on-track, and the depth of experience of Wales’ personnel will greatly enhance customers’ services experience.”

The Civil Aviation Authority granted GE Wales EASA Part-145 approval for the overhaul of the GP7200 engine on July 24. And, in France, Snecma has received DGAC (Direction

Général de l’Aviation Civile) approval for overhaul of the engine’s high-pressure compressor. “With these approvals,” says Geiger, “the Alliance has met its objective of attaining overhaul shop EASA certification to maintain revenue service GP7200 engines prior to entry into service.”

In addition to Emirates, the GP7200 has been selected to power A380 aircraft for Air France, Korean Air and the International Lease Finance Company.

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## The GP7200 Engine File

- Type certifications from the European Aviation Safety Agency (EASA) and the U.S. Federal Aviation Administration (FAA)
- One of the most extensively tested engines designed specifically for large, four-engine commercial aircraft, accumulating more than 5,200 hours of ground testing and 274 flights and 3,202 engine flight hours aboard the A380
- Meets stringent Stage 4 noise regulations; fully compliant with London’s Heathrow Airport QC2 departure and QC0.5 arrival noise limits
- Emissions well below current and anticipated regulations
- Lowest fuel burn on the A380 aircraft (can fly up to 12,000 kilometers on a full passenger load), reducing greenhouse gas emissions and creating significant savings in fuel costs and emission fees



## Component Repair Highlights

New repairs are continually introduced to help improve customers’ cost of ownership. Here are some latest releases and updates:

### **CF6-80C/-80E Stage 1 and 2 HPT Blade Under Platform Coating Upgrade:**

Enhanced coating that reduces shank corrosion, nearly eliminating scrap for this cause—resulting in more than 10% reduction for the Stage 1 blade.

### **CFM56-5B/P, -5C/P and -7 HPT Nozzle**

**Split Vane Repair:** Repair that replaces a distressed lead or trail vane with new material, increasing current yield by as much as 30% and restoring part performance.

### **CFM56-5B/-7B HPT Blade RD# 150-676-P9 (Full Repair) and 150-784-P7 (Rejuvenation Repair)**

have been recently revised to include marking the HPT blade cycles “since new” on each blade to enhance blade life management. Please include on your repair purchase order the number of HPT blade cycles since new for each blade serial number.

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appraisers reflect the true market value of the asset. We also like the convenience of tracking used CFM56 engines by serial number.”

The TRUEngine designation also facilitates CFM’s ability to provide technical support. Jet engines contain multiple, complex systems whose interactions must be carefully controlled. CFM’s engine support is built upon technical expertise for genuine CFM56 parts and configurations as well as data gained from the vast operational history of the global CFM56 engine population.

“Having CFM confirm that the engines have been maintained to the original manufacturer’s standards will help appraisers reflect the true market value of the asset.”

—Gehan Talwate, Ascend

Says Mike Van de Ven, executive vice president and chief operating officer of Southwest Airlines, “Our long-standing relationship with CFM has consistently provided

## GE, SAFRAN Renew CFM Partnership Until 2040

General Electric Company and Snecma (SAFRAN Group), parent companies of CFM International, have signed an agreement that extends the 50/50 partnership to the year 2040.

The original framework agreement was signed in 1974. With 405 million flight hours in commercial and military service to date, CFM now has the largest installed base in the world. With this extension, the two parent companies are strongly positioning CFM for continued long-term success in developing the next-generation engine.

“Our industry is in the midst of perhaps the most challenging times we have ever faced,” says Jean-Paul Herteman, CEO of SAFRAN Group. “In the early 1970s, the GE/Snecma partnership brought the benefits of high-bypass turbofan technology to reduce fuel burn by 20% compared to the low-bypass engines they replaced, while introducing a new standard in reliability. We are now in a position to bring that same magnitude of improvement to the industry for the next 30 years.”

CFM designs and continually improves the CFM56\* family. To date, more than 18,500 CFM56 engines powering 30 different applications have been delivered to nearly 500 operators worldwide.



us with exceptional quality, reliability and value. Achieving TRUEngine status is one more way in which Southwest Airlines can differentiate our fleet from our competitors.”

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<sup>1</sup> Sources: Asset value for CFM56-3B engines based on 2007 assessments by IBA and Ascend.

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