

Product Support Survey

by Matt Thurber

Rolls-Royce and Williams International took first place for the turbofan segment in this year's **AIN** Engine Product Support Survey with a tied Overall Average of 8.2 (out of a possible 10). Williams retains its first-place status from last year, while Roll-Royce climbed from last year's second place. In second place this year are GE and Pratt & Whitney Canada at 8.0.

Honeywell came in third place with an Overall Average

of 7.9, followed by CFE in fourth place at 7.8.

On the turboprop/turboshaft side, Honeywell kept its first-place lead from last year, with an 8.4 Overall Average. Pratt & Whitney Canada came in second place, rated at 7.6, followed by Safran at 7.4.

In almost every case, Overall Average scores reflect a drop from last year's ratings, ranging from 0.3 to 0.1. Safran's rating of 7.4 remains the same as last year.



Rolls-Royce

Survey Rules and Methodology

As with **AIN** Publications' previous annual Product Support Surveys, the objective this year was to obtain from the users of business jets, pressurized turboprop airplanes, and turbine-powered helicopters statistically valid information about the product support provided by engine manufacturers over the last year and to report this information to our readers. The goal is to encourage continuous improvement in powerplant product support throughout the industry.

This survey was conducted via a dedicated website, created by **AIN** from the ground up to provide improved ease of use and to encourage greater reader participation. **AIN** emailed qualified readers a link to the survey website and also sent a postcard invitation with login credentials to the survey website.

The survey website was open from May 1 to June 7. Respondents were asked to rate the engines they use. Respondents were also asked to rate, on a scale from 1 to 10, the quality of service they received during the previous 12 months in the following categories:

- » **Factory Service Centers**—cost estimates versus actual time, on-time performance, scheduling ease, service experience.
- » **Authorized Service Centers**—same as above.
- » **Parts Availability**—in stock versus back order, shipping time.
- » **Cost of Parts**—value for price paid.
- » **AOG Response**—speed, accuracy, cost.
- » **Warranty Fulfillment**—ease of paperwork, extent of coverage.
- » **Technical Manuals**—ease of use, formats available, timeliness of updating.
- » **Cost-per-Hour Programs**—cost versus benefits, ease of administration.
- » **Technical Reps**—response time, knowledge, effectiveness.
- » **Overall Engine Reliability**—how the product's reliability and quality stack up against the competition.

Respondents were also asked to recognize individuals who have provided them with exceptional product support and service.

The 2019 **AIN** Product Support Survey results for aircraft appeared in the August issue. Flight-deck avionics and cabin electronics were featured last month. ■

ROLLS-ROYCE

The Results

Rolls-Royce's Tay engine, which powers the hundreds of Gulfstream GIVs and G450s that were built, garnered an Overall Average of 8.3 from **AIN** readers, putting it in second place in the turbofan segment. The AE3007 came in right after the Tay, with an 8.2 and third place, tied with Williams International's FJ44. Top ratings for the two Rolls-Royce engines include for the Tay, Factory Service Centers (8.6), Authorized Service Centers (8.8), Parts Availability (8.4), AOG Response (8.7), Warranty Fulfillment (9.2), and the highest rating for Overall Engine Reliability (9.4, tied with GE's CF34). The AE3007 received a top rating for Cost of Parts (7.8). Rolls-Royce's BR series came in fourth place, tied with GE's CF34 with a rating of 8.1.

The Improvements

"Rolls-Royce is entirely dedicated to our business aviation customer base," said Alan Mangels, v-p of sales

and marketing. "Everything we do is admitting and recognizing that the customer is a different animal than other customers. In the market we deal with—the higher end of business aviation—people can fly anywhere, and we need to be there step-by-step should they need it. The infrastructure that goes into that is incredible and quite costly, but it's what we need to do to support our customer base."

At its Birmingham, UK headquarters, Rolls-Royce opened a new Aircraft Availability Center in July, staffed by a team dedicated to helping keep customers' aircraft flying.

At last year's NBAA show, Rolls-Royce introduced a significant change to its CorporateCare maintenance coverage program, CorporateCare Enhanced. The improvements stemmed from meetings with Rolls-Royce's Corporate Customer Council, according to Andy Robinson, senior v-p of service for business aviation. "They helped us define our service excellence

strategy," he said, "and shaped CorporateCare Enhanced. That's a big part in how it's becoming so successful." Since launching, Roll-Royce has signed up more than 200 CorporateCare Enhanced customers, on top of the 2,200-plus regular CorporateCare clients.

The difference between the two programs is that CorporateCare Enhanced fills in some gaps in coverage, such as troubleshooting and labor costs. Typical customers for the new program include BR710 and BR725 operators, and when the new Pearl 15 enters service on the Bombardier Global 5500 and 6500, Rolls-Royce expects most buyers will opt for CorporateCare Enhanced. On that engine, said Mangels. "we are the OEM for all nacelle components and the thrust reverser and nose cone. It's the right thing to do, to make this part of the CorporateCare service package. Any type of event under the engine and nacelle, we cover. That includes troubleshooting and corrosion."

Another element of CorporateCare Enhanced is



› Rolls-Royce continued

the new Proactive Maintenance Planning Tool, which helps identify opportunities to add improvements and modifications during a planned maintenance visit.

The Pearl 15 will feature new capabilities for vibration and health monitoring, including the ability to monitor LRU (line-replaceable unit) health and two-way communications via satcom for remote monitoring and re-configuring monitored parameters, of which more than 10,000 can be monitored. This will help Rolls-Royce respond to problems faster and avoid events that cause downtime.

Rolls-Royce has added a new spares store in Beijing for China-based CorporateCare customers. The company has also added on-wing service technicians in Europe and Asia as well as grown its service center network to 78 (with plans for more later this year).

One of the criticisms from customers has been the quality of technical publications. "Rolls-Royce is taking this seriously," said Robinson, and the company introduced a new technical publications platform at the last Customer Council meeting. "Feedback is that it's a game changer," he said. "In the past it's fair to say that technical publications were designed around the engineer working in the shop as opposed to the customer in the field," he explained. The new publications focus more on improving the customer experience.

Later this year, Rolls-Royce expects to launch its new business aviation customer web-portal. Users will be able to "view information on their fleet, engine health, review their CorporateCare account, buy parts, and eventually pay bills and order services."

2019 Overall Average Ratings of Engine Manufacturers

	Overall Average 2019	Overall Average 2018	Ratings Change from 2018 to 2019
Turbofan			
Rolls-Royce	8.2	8.3	-0.1
Williams	8.2	8.4	-0.2
GE Aviation	8.0	8.2	-0.2
Pratt & Whitney Canada	8.0	8.2	-0.2
Honeywell	7.9	8.0	-0.1
CFE	7.8	7.9	-0.1
Turboprop/Turboshaft			
Honeywell	8.4	8.7	-0.3
Pratt & Whitney Canada	7.6	7.7	-0.1
Safran Helicopter Engines	7.4	7.4	0.0

Companies listed in order of 2019 overall average. Ties listed alphabetically by manufacturer.

WILLIAMS INTERNATIONAL

The Results

Williams International's FJ44 achieved a third-place ranking this year with an 8.2 Overall Average, down slightly from last year's 8.3 and second place. The company received its highest ratings, a 9.1, for Technical Reps, and for Cost Per Hour Programs (8.3).

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2019 Overall Average Ratings by Individual Engine

		Overall Average 2019	Overall Average 2018	Ratings Change from 2018 to 2019	Factory Service Centers	Auth. Service Centers	Parts Availability	Cost of Parts	AOG Response	Warranty Fulfillment	Technical Manuals	Technical Reps	Cost per Hour Programs	Overall Engine Reliability
Turbofan														
Pratt & Whitney Canada	PW600 series	8.5	8.2	0.3	8.0	8.5	8.4	7.3	8.6	9.2	8.6	8.9	7.8	9.2
Rolls-Royce	Tay	8.3	8.2	0.1	8.6	8.8	8.4	6.3	8.7	9.2	7.6	8.8	7.0	9.4
Rolls-Royce	AE3007	8.2	8.5	-0.3	8.1	7.8	8.2	7.8	8.4	8.5	7.7	8.4	7.5	9.1
Williams	FJ44	8.2	8.3	-0.1	8.1	8.2	8.0	6.4	8.2	8.7	8.4	9.1	8.3	8.7
GE Aviation	CF34	8.1	8.3	-0.2	7.6	7.6	8.1	7.0	8.2	8.4	7.6	8.4	8.0	9.4
Rolls-Royce	BR700 series	8.1	8.2	-0.1	8.4	8.5	8.2	6.7	8.5	8.5	7.4	8.7	7.1	9.3
Honeywell	TFE731	8.0	8.0	-0.0	7.7	8.3	8.0	7.1	8.5	8.6	8.0	8.4	6.3	8.8
Pratt & Whitney Canada	PW300 series	8.0	8.2	-0.2	7.7	8.4	8.2	6.9	8.4	8.7	7.9	8.1	7.3	8.7
Pratt & Whitney Canada	PW500 series	7.9	8.2	-0.3	6.8	7.7	7.8	6.9	8.0	7.9	8.4	8.6	7.2	9.1
CFE	CFE738	7.8	7.9	-0.1	7.1	7.4	8.1	7.0	7.8	7.5	8.4	8.4	7.6	9.2
Honeywell	HTF7000	7.8	8.1	-0.3	7.1	8.3	7.0	7.1	8.0	8.1	7.5	7.8	7.4	8.8
Pratt & Whitney Canada	JT15D	7.8	7.7	0.1	7.5	7.8	8.2	6.2	7.8	7.5	8.0	7.6	7.4	9.1
Turboprop/Turboshaft														
Honeywell	TPE331 turboprop	8.4	8.8	-0.4	8.5	9.1	8.4	6.3	8.4	9.0	8.5	9.0	8.6	9.5
Pratt & Whitney Canada	PT6A turboprop	7.7	7.8	-0.1	6.6	7.2	8.0	6.3	7.8	7.5	8.2	8.1	7.3	9.3
Pratt & Whitney Canada	PT6T/B/C turboshaft	7.7	7.5	0.2	8.5	7.8	7.1	6.4	7.7	8.5	8.0	8.0	7.1	8.6
Pratt & Whitney Canada	PW200 series turboshaft	7.2	7.7	-0.5	7.5	5.9	6.7	6.5	6.9	7.7	7.0	7.4	6.9	8.4
Safran Helicopter Engines	Arriel	7.2	7.4	0.0	7.3	7.8	7.2	5.9	6.5	7.3	7.3	8.2	6.6	7.5

Companies listed in order of 2019 overall average. Ties listed alphabetically by manufacturer.



Williams International continued

The Improvements

The number of Williams International engines now exceeds 6,000 FJ44s and FJ33s that have flown more than 14 million hours. A high percentage of those owners are enrolled in the Williams Total Assurance Program (TAP) Blue program, which also covers foreign object damage, eliminating the need for operators to try to seek engine coverage from their insurance provider. Williams International welcomes operators not enrolled in TAP Blue to join the program or to upgrade from older programs.

In its effort "to monitor maintenance requirements to find areas to make ownership easier and more economical," the company said, "Some routine periodic inspection requirements were eliminated, which lowers overall cost to owners." For TAP customers operating the FJ44-3A, Williams extended hot-section inspection intervals, which also helps lower costs and increases aircraft availability.

Another new effort is Williams International's new customer app, available for iOS or Android devices, which gives operators the ability to contact Williams and find authorized service centers and to schedule maintenance.



Williams

GE AVIATION

The Results

GE's CF34 ranked in fourth place with an 8.1 Overall Average, down 0.2 from last year's second-place finish. The CF34 received the highest rating for Overall Engine Reliability (9.4).

The Improvements

With entry into service of the Passport turbofan powering Bombardier's Global 7500, GE Aviation has added resources to its global service and support network. This also benefits operators flying Challenger business jets powered by GE's CF34.

"We've got a great customer support organization around the world from our partnered service centers and mobile repair teams," said Jim Stoker, general manager for business and general aviation support for GE Aviation. "We've been beefing up our personnel, focusing on critical areas that we believe are going to have a higher concentration of Global 7500 business jets. That's Asia, the Middle East, Australia, as well as the big regions like Europe and the U.S. Over the last two years, our team has completed a significant number of simulations of potential service-event scenarios," he said. "We

have stress-tested the entire process. We're ready for our customers."

In April, GE Aviation added a new authorized service center for the Passport and CF34-3, Bombardier's Tianjin, China facility, bringing the support network to nearly 40 service centers. Eight Bombardier service centers are members of the GE Aviation network, serving customers in China, England, Singapore, and the U.S. Bombardier's line station network in Europe and U.S. mobile repair fleet also have service agreements with GE. For mobile service outside the U.S., GE and Lufthansa Technik Aero Alzey have a maintenance support agreement that covers Passport and CF34 customers. In the U.S., GE's Strother, Kansas mobile repair team supports customers in the Americas.

GE's OnPoint service program is available for Passport operators, covering the entire propulsion system, and "GE has made good traction signing Global 7500 customers up to its OnPoint program," the company said. "Our OnPoint customers get the benefit of the most advanced engine on the market, as well as a support network around the world to give them peace of mind," Stoker said.



GE Aviation

PRATT & WHITNEY CANADA

The Results

AIN readers gave top ratings to support for Pratt & Whitney Canada's PW600 series, with an 8.5 Overall Average moving the PW600 into first place, up 0.3 from last year's third-place. AIN readers gave P&WC's PW600 support top marks for Parts Availability (8.4), Warranty Fulfillment (9.2), and Technical Manuals (8.6).

The PW300 series shared fifth place with Honeywell's TFE731 with an 8.0 rating, while the PW500 series scored 7.9.

In the Turboprop/Turboshaft segment, P&WC's PT6A and PT6T/B/C engines shared a 7.7 Overall

Average for second place, followed by the PW200 series in third place. The PT6T/B/C received top marks for factory service centers (8.5).

The Improvements

P&WC's work during the past year to improve product support covers a range of activities, from expanding the service network to improving service solutions and new customer experience capabilities.

In February, the P&WC service network added Manitoba, Canada-based Portage Aircraft Maintenance as a designated maintenance facility (DMF)

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Pratt & Whitney

» Pratt & Whitney Canada continued

for agricultural operators flying PT6A-powered aircraft. To support Leonardo AW139s in China, the engine manufacturer added a new DMF, Citic Offshore Helicopter. As DMFs, these facilities and others like it provide line maintenance and mobile repairs. P&WC opened a new PT6A and PW200 overhaul shop in Belo Horizonte, Brazil. In addition to overhauls, the facility will also provide hot-section inspections and accessory repair and overhaul to support agricultural, helicopter, and general aviation operators in Brazil. P&WC is planning to add another DMF by the end of this year.

On the service solutions side, P&WC has doubled the calendar time on its Certified Pre-Owned program for PT6A and helicopter engines from one year or 500 hours to two years or 500 hours, according to the company.

For the P&WC Fleet Service Plan (FSP), which applies

to operators with two to five helicopters, three new optional add-on packages are now available. According to P&WC, “FSP helps our customers grow from single aircraft, retaining the simplicity of ESP [Eagle Service Plan] with the personalization of FMP [Fleet Management Plan].”

P&WC has added three new services to its ESP, designed to help improve aircraft availability, including a much more sensitive oil analysis technology that enables analysts “to detect deterioration of oil-wetted parts—at times hundreds of hours in advance of a potential issue.” Operators who take advantage of P&WC’s FAST engine health monitoring service can also share engine information more quickly via P&WC’s 3G global engine connectivity solution. The third service is new flyaway kits equipped with commonly needed parts that operators can keep on hand to speed resolution of engine issues.

The new “Know My PT6” app, available for iOS and Android devices, extends the information in the Know Your PT6 booklet that P&WC publishes, all to improve PT6 operators’ customer experience. The app includes all the content from the booklet plus adds Service Information Letter excerpts that are relevant for the operator, access to P&WC’s customer portal, a way to contact the Customer First Centre quickly, and location and contact information for authorized service centers and parts distributors on an interactive world map. Other useful features include news alerts, videos such as a second engine rigging series for Cessna Caravan pilots, owners, and mechanics, a library of “helpful insights” from the Airtime customer blog, and “descriptions and schematics of design features, engine controls, and operational and maintenance recommendations.”

HONEYWELL

The Results

On the turboprop side, Honeywell’s TPE331 came in first place, with an Overall Average of 8.4. The TPE331 received top ratings in almost every category, including Factory Service Centers (8.5), Authorized Service Centers (9.1), Parts Availability (8.4), AOG Response (8.4), Warranty Fulfillment (9.0), Technical Manuals (8.5), Technical Reps (9.0), Cost Per Hour Programs (8.6), and Overall Engine Reliability (9.5).

Honeywell’s TFE731 earned the same 8.0 Overall Average rating as last year, putting it in fifth place. The HTF7000 saw a drop in its Overall Average rating, to 7.8 from last year’s 8.1.

The Improvements

During the past year, Honeywell has added local support for operators of its engines to deliver more personalized support. This includes hiring more field

service engineers and customer support managers who spend time visiting local operators. Customers can quickly find their regional reps using Honeywell’s Direct Access app, which is available in iOS and Android versions.

At its operator conference, Honeywell consulted with operators of its engines to help improve the agenda and format. The company also added in-depth technical breakout sessions and a live help desk during the conference to help customers troubleshoot and solve engine problems while on-site.

For operators who require a rental engine, Honeywell is helping lower the time needed for engine installation. To accomplish this, Honeywell said it has “expanded engine inspections and is rolling out digital logbooks using blockchain technology that will provide secure, up-to-date access to engine maintenance information.”



Honeywell



Safran Helicopter Engines

SAFRAN HELICOPTER ENGINES

The Results

The Safran Arriel turboshaft ranked third place with a 7.2 Overall Average, tying for third with P&WC’s PW200 series.

The Improvements

Safran Helicopter Engines offers its Support-By-the-Hour (SBH) program for helicopter engine maintenance services, and now customers can use the Online SBH to access program information online. SBH provides operators with “predictability, flexibility, and cost control,” according to Safran.

Some of the features in Online SBH include easier and faster reporting of flight hours as well as capability for monitoring data history, “thanks to an intuitive graphics analysis tool.”

Rollout of Online SBH began this year, but Safran said, “Its availability may vary depending on users’ geographical location and organization compatibility.”