



BELAC NEWS

A Chromalloy Joint Venture Company

From the President of BELAC LLC

A few weeks ago, BELAC achieved another significant milestone — shipment of the 300th set of CFM56-3 first stage High Pressure Turbine engine blades. The set went to a carrier that has used BELAC blades for several years.

Soon we will reach another milestone — and offer you an expanded selection of FAA-endorsed equipment, as our newest BELAC HPT blades become FAA certified.

Since we began designing, producing and shipping equipment in 2002, we've delivered more than 61,000 HPT blades. Our blades have logged more than 350 million flight hours. Every BELAC blade has performed without a single safety or performance issue. Over the years we've worked closely with you to assure superior equipment and new product developments that fully meet your needs.

Sales have grown at a rate of 50 percent in the last three years. Our customers — the airlines; U.S. military; aircraft brokers; and maintenance, repair and overhaul shops — increasingly are taking advantage of BELAC equipment priced significantly lower than the OEMs. BELAC blades deliver the same or better performance in the engine and demonstrate significantly better repair rates.

Our mission is clear: Product integrity at each step, an unyielding commitment to quality assurance and full FAA oversight. BELAC's dedicated staff is on call 24/7 to serve you. We encourage you to rely on BELAC — and let us show you our very newest products.

Chong Yi
President



BELAC hosts aviation officials from Asia during site tour, product briefing

A group of industry officials from Asia toured BELAC headquarters recently in Oldsmar, Fla., and received a summary on High Pressure Turbine (HPT) blades as an alternative to Original Equipment Manufacturer (OEM) equipment.

Mehrdad Vandyoussefi, Ph.D., BELAC Director of Engineering, presented product information. Dennis Piotrowski, FRAeS, Vice President, Quality, provided a review of quality assurance and inspection processes that assure product integrity. Also covered was an overview of the Bilateral Airworthiness agreement in place that provides for reciprocal approval on FAA-certified aircraft equipment. Bruce Johnson, Chromalloy Vice President,

Engineering, provided a briefing on the Designated Engineering Representative (DER) repair process, Product Support and Continued Operational Safety (COS) processes and compliance as well as Chromalloy's new engineering facility at Palm Beach Gardens, Fla.

Chong Yi, President, outlined the economic advantages of BELAC High Pressure Turbine (HPT) blades for airlines. Yi outlined the

cost savings on BELAC equipment, which has been demonstrated over millions of flight hours and is available at attractive savings compared to OEM catalog pricing.

In addition to touring the BELAC facility, the group also visited nearby Chromalloy Castings. BELAC, a Chromalloy joint venture with major airlines, utilizes the nearby investment casting foundry in Tampa, Fla., for the casting of its HPT superalloy blades. 🌐

BELAC speaker at PMA Summit highlights unique value chain



BELAC offers turbine operators high quality engine components, improved repair rates and reduced expenses.

Rob Church, Director, Sales and Marketing, highlighted the unique BELAC value chain during his presentation at the first-ever Aviation Maintenance International PMA Summit in London.

"The benefits of BELAC reengineered components include use of in-house casting capabilities, EDM cooling holes, superior coatings, tighter tolerances and stringent quality control," Church said.

"BELAC, a Chromalloy joint venture, has attained more than 350 million flight hours on our equipment — as the only PMA company reengineering large commercial engine high pressure turbine blades. We utilize the entire Chromalloy value proposition to ensure top performance," he added. 🌐

Chromalloy Castings hosts AIA President and CEO Marion Blakey



Marion C. Blakey, President and Chief Executive Officer of the Aerospace Industries

Association based in the Washington, D.C., area, recently toured the new Chromalloy Castings facility in Tampa, Fla.

Dennis Piotrowski, FRAeS, BELAC Vice President of Quality, hosted Blakey. BELAC utilizes nearby Chromalloy Castings for all of its High Pressure Turbine (HPT) blade production. Formerly a Federal Aviation Administration (FAA) senior executive, Piotrowski discussed BELAC products and services.

Mike Beffel, Ph.D., Vice President of Operations, provided an overview of Chromalloy and its ownership, Sequa Corporation. Tom Trotter, Vice President and General Manager, Chromalloy Castings, provided a tour.

During her tour, Blakey acknowledged the high degree of technology, organization and professionalism at Chromalloy Castings.

Blakey became the eighth full-time chief executive of the association in 2007. Before that she served as administrator of the FAA. Prior to being named FAA Administrator, Blakey chaired the National Transportation Safety Board (NTSB). 🌐

Upcoming Events:

November 30-December 1, 2011

UBM Airline Engineering & Maintenance Conference – Latin America
Supporting sponsor, Presenter: Rob Church

February 1-2, 2012

MRO – Middle East



For information about pricing and availability, contact

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From the BELAC Technical Team

Editor's note: The BELAC Sales and Technical staffs respond regularly to questions on a variety of topics ranging from products, pricing and availability to technical questions about repairs, exchanges and operation of BELAC parts. A question appears in each edition of **BELAC News**, with a response provided by a BELAC expert.

If you have a question for the BELAC staff, please visit the BELAC website at www.belac.com/contact/ to submit it. You will receive an individual response when you provide your contact information. General questions and answers may appear in upcoming editions of **BELAC News**.

Question: What does 'inspection' mean from a practical standpoint?

BELAC: Inspection establishes that the manufacturing process is under control. There is an old but true statement in quality: "You cannot inspect quality into a part — it must be designed and built in." A properly designed inspection program can only verify that a process is under control.

Another goal of an inspection program is the degree of confidence in the process. Was it benchmarked? Was a First Article performed? Has the process been thoroughly documented and "frozen"? Are all variables defined and have Design of Experiments (DOE) been run at the extremes to document the interactions of the variables, and the effect on the product quality?

BELAC's inspection system is designed to verify that the casting, machining and coating processes are under control. Inspection systems are normally considered to be Quality Assurance programs.

Quality Assurance is the systematic monitoring and evaluation of the various aspects of a project, service or facility to maximize the probability that the production process is attaining minimum standards of quality.

Just as important and often overlooked is the Quality Control component. Quality Control is the process by which BELAC reviews the quality of all factors involved in production. Quality Control emphasizes testing of products to uncover defects whereas Quality Assurance attempts to improve and stabilize production and associated processes to avoid or minimize issues that led to defects. For contract work — particularly work awarded by government agencies — Quality Control issues are among the top reasons for non-renewal of a contract.

At BELAC, everyone has a role in quality. Everyone! 🌐

FAA, BELAC discuss more effective path to PMA certification



Senior leaders from BELAC met recently with Federal Aviation Administration (FAA)

officials to discuss ways to further improve the process for certifying new Parts Manufacturer Approval (PMA) turbine engine equipment.

The rigorous path to certification of a new component, which takes one or more years to complete, would retain all requirements and procedures to demonstrate and validate the new equipment. Changes would streamline design and test reporting areas, among others.

Chong Yi, President, BELAC, said, "This is important to BELAC and our customers, in helping us improve time to market for key products while ensuring full FAA compliance and performance of equipment."

Dennis Piotrowski, Vice President, Quality, and Mehrdad Vandyousefi, Ph.D., Director of Engineering, were among the BELAC leaders who met with FAA officials Mark Bouyer, FAA Manager of Engine and Propeller Directorate, Standards Staff, and Chip Queitzsch, Ph.D., Chief Scientist and Technical Advisor for Engine System Dynamics.

The group discussed approvals for new BELAC developments. BELAC engineering, development, testing and design review processes

and reporting were all reviewed. Rigorous testing by BELAC verifies that the company's parts are equivalent to those produced by Original Equipment Manufacturers (OEM), Yi said.

To date BELAC has delivered more than 61,000 High Pressure Turbine (HPT) blades to commercial airlines around the world and the U.S. military. The PMA parts are subject to rigorous FAA requirements.

The company currently produces the following HPT blades: CFM56-3 (first stage); CF6-50 (first and second stage); CF6-80A2 (first stage); CF6-80C2 (first and second stage); and PW4000 (first stage). New parts are in development. 🌐