



The **Proven** Alternative

PSM 7FA Series R0 Compressor Blade

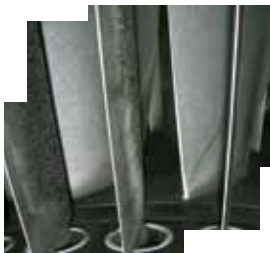
PSM's R0 Compressor Blade for the General Electric Frame 7FA+e gas turbine is now commercially available.

Available now for 7FA+e gas turbines equipped with the "Flared" compressor design. The blades have been successfully field validated under normal commercial service including typical inlet-fogging and on-line water wash use. This allows the machine to operate without restriction and without periodic in-situ inspections allowing users to achieve intended operational reliability and availability.

Since its introduction, the Frame 7FA+e R0 compressor blade has been a major maintenance issue for end users. During this period, operators needed to perform periodic and frequent inspections designed to identify blade cracks prior to a potential in-service blade failure and possible downstream compressor damage.

PSM has performed a complete redesign of this component. To identify the root cause, PSM heavily instrumented a number of 7FA+e "Flared" compressor machines and closely monitored these units for any anomalous operation. PSM characterized both new and failed 7FA+e R0 blades and conducted finite element lifing and vibratory analyses using the data gathered from these machines. With this information, PSM was able to identify the root causes of the failures and immediately implemented the necessary fixes and improvements to the design. Extensive field validation tests of the design have demonstrated success.

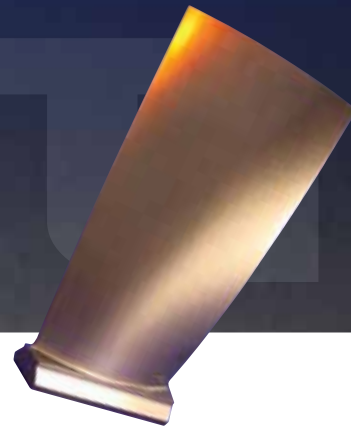
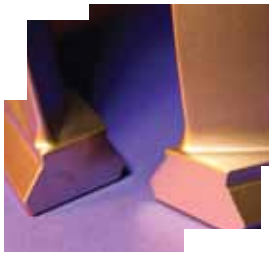
The PSM R0 blade design is fully interchangeable as a set and requires no other machine modification. Installation can easily be completed during a short user-defined outage. For a list of installation references, please contact PSM.



IMPROVED RELIABILITY & AVAILABILITY

PSM's gas turbine compressor blades are made using advanced materials and design features to maximize durability and reliability of our components in your engines. **To accomplish this we:**

- + Identify the issues and failure mode in current OEM products
- + Use state-of-the-art analytical tools to model the issues
- + Use the same analytical tools to design and fabricate new hardware with longer life
- + Validate the product in real-world testing



Example of Design Improvements Incorporated in the R0 Design:

- + Material Change to a Higher Strength Alloy
- + Compound Variable Conical Fillet
- + Attachment undercut to address fretting
- + Airfoil restacked to reduce steady stresses along the leading edge
- + Re-tuned Airfoil to reduce vibratory stress response

The fleet leader has been running since May 2008, and has accumulated over 10,000 hours, 80 starts with 800 hours of inlet fogging, and 8 hours of On-Line Water Wash.

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