

# RECONDITIONING SERVICES

## Extend the Life of Your E- and F-Class Parts, Both OEM and PSM

In today's highly competitive energy market, power producers need to achieve peak performance while minimizing life cycle costs. PSM can help with a full spectrum of parts reconditioning services — all backed by PSM engineering, advanced technology and Alstom's global network. These state-of-the-art reconditioning services can extend the life of your components and optimize your maintenance budget.

### PSM Reconditioning Services

- + Reconditioning of both OEM and PSM parts
- + New 8500 m<sup>2</sup> facility in Florida in addition to the Alstom global workshop network
- + Advanced F-Class process technologies: CNC laser welding, High temperature diffusion brazing, Chemical stripping and APS/HVOF thermal spray coatings
- + Complete machine shop services: CNC grinding, CNC milling, RAM EDM and CNC EDM hole drilling
- + Complete NDT and metallurgical services on site: FPI, Digital x-ray, CMM and Scanning Electron Microscopy
- + Full warehouse of spare and emergency parts for select E- and F-Class turbine models



## Reconditioning backed by engineers.

In our state-of-the-art reconditioning facility, design engineers work side-by-side with repair specialists to inspect and analyze both OEM and PSM engine-run parts. We utilize digital x-rays, coordinate measuring machines, non-destructive testing, and a fully equipped materials and testing lab. We determine the best method of repair and use the most advanced equipment to perform every operation — from laser welding and HVOF coating, to belting and finishing. And unlike any other reconditioning facility in the world, PSM allows you to take advantage of our patented new part design upgrades during repair — a unique combination that adds value to your parts and reduces your cost of operation.



Metallurgical Lab

## The Reconditioning Process

The typical PSM reconditioning process consists of these steps:



FPI



Digital X-ray

### Assessment

- + Visual Inspection
- + Metallurgical Investigation
- + Ultra-sonic Wall-thickness
- + Eddy Current
- + Thermography
- + Airflow
- + Fluorescent Penetrant Inspection (FPI)
- + Digital X-ray

### Cleaning/Preparation

- + Sandblasting
- + Chemical/Acid Stripping
- + Salt Bath
- + Fluoride Ion Cleaning (FIC)
- + Ultrasonic Cleaning
- + Insert Removal

### Repair

- + Belting/Finishing
- + Manual Welding
- + Laser Cladding
- + Diffusion Brazing
- + Heat Treatment
- + Honeycomb Replacement
- + Insert Replacement
- + Coupon Repair

### Machine Shop Services

- + CNC Grinding
- + CNC Milling
- + RAM EDM
- + CNC EDM
- + Horizontal Milling

### Coating

- + HVOF – MCrAl<sub>y</sub>, CrC
- + APS – TBC, MCrAl<sub>y</sub>
- + Internal Aluminide
- + Dual Wire Arc – Al Root Seal

### Quality/Final Inspection

- + Reconditioning takes place in an ISO 9001:2000 and ISO 14001 certified environment. The entire reconditioning process is fully documented. This includes part identification numbers, details about each step in the process, relevant process specifications, any design upgrades, and a record of the quality checks performed after each stage.



CMM/Dimensional Inspection



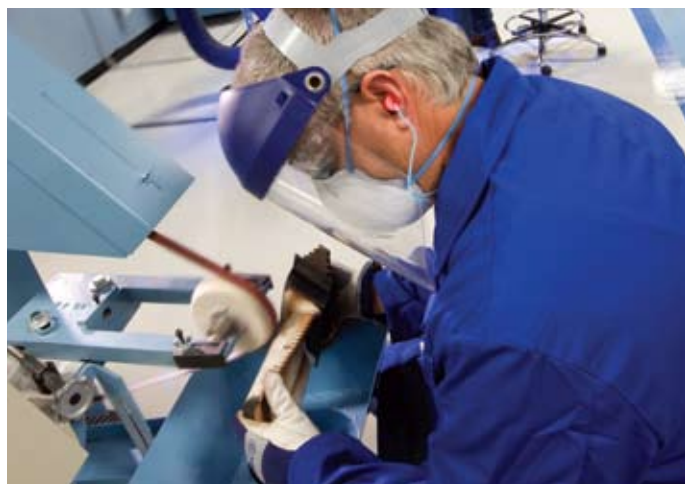
Coating

### Local Repairs. Global network.

The PSM Repair Development Team is part of the Alstom worldwide reconditioning network and will leverage the latest process technologies and repair best practices to expedite the development process. For customers in Europe, Middle East, and Asia, PSM uses the Alstom network of shops in Dubai, Switzerland, Croatia, and Kingdom of Saudi Arabia, where we have established appropriate repair processes. For customers in the United States, PSM conducts all reconditioning services in our new 8500 m<sup>2</sup> facility in Jupiter, Florida. This facility is co-located with the new parts manufacturing business unit and allows close communication with the engineers that design and manufacture our advanced turbine parts.

### Reconditioning for a full range of parts.

Our reconditioning solutions encompass E- and F-Class technologies for both PSM and OEM gas turbine components and the product portfolio includes airfoils, combustion and fuel nozzles. Because of PSM's position as a comprehensive parts supplier, we can also provide a complete range of capital spares for your outage.



Belting/Finishing



Assessment

PSM can provide reconditioning services for Frame 6B, 7E, 9E, 7F, 9F and W501F gas turbines.  
Ask your sales rep for details.

The PSM/Alstom network includes substantial experience: more than 1500 E-Class and 500 F-Class airfoil sets per year are worked on, and substantial experience exists in combustor parts.

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