

Business Partners: Features

With all the activity in this sector of the market, if you have been out of touch with any repair shop for more than about a year it's reasonable to believe there have been significant changes. If there have been none, that's significant, too, because it may mean competitors are now more capable. Keep in mind that hardware is not the only variable of importance: Highly skilled people come and go. This is especially true in times of industry expansion.

Between the 1Q and 2Q issues, several shop-related events took place, including the following: Phoenix Turbine LLC, Gilbert, AZ, held an open house to show off its new capabilities.

New shop repairs, makes HGP parts for wide range of GTs

Phoenix Turbine LLC's open house at its new repair and manufacturing facility in Gilbert, Ariz, attracted gas-turbine experts from across the Southwest. Utility and independent power producers with reservations for the recent shop tour and Texas-style BBQ lunch included Arizona Public Service Co, Arizona Electric Power Co-op Inc, Calpine Corp, Dow Chemical Corp, NV Energy, Salt River Project, and Tucson Electric Co.

The meticulous 20,000 ft² shop reflects a significant move by the company to expand its menu of services to owner/operators of F-class machines while maintaining expertise in older units, and smaller ones as well. Phoenix Turbine is one of several repair facilities pursuing F-class opportunities. With many of these engines coming up on a decade of operation, and owners stepping back from

OEM long-term service agreements, having a larger shop allows Phoenix to capitalize on economies of scale in component repair and manufacturing. To fill the repair and manufacturing center, the company hired F-class repair veteran Todd Dunlop as director of sales. Strategy of the managing partners—Bob Harrison, Joe Girmonde, and Allen Brackett—is simple: Make repairs and new parts faster, better, and at lower cost than the competition. A wide range of new parts is already on the shelves, and with added inspection and repair capabilities additional shop space already is under consideration. Senior operations personnel may recall Harrison's deep experience in GT repairs. Before Phoenix, he served as president and general manager of Chromalloy Heavy Industrial Turbines and founded Industrial Turbine Technology (ITT), which eventually became Wood Group HIT Ltd.

New parts. The company has two main lines of business: manufacture and repair of hot-gas-path (HGP) parts. Core competencies include the cost-effective production of shroud blocks for all GE frames through 7FA (plus Frame 9), and transition pieces (TPs) for the Siemens W501s (AAs through D5As). Plus, TP floating seals, clamshells, baskets, crossfire tubes, segment seals, spring seals, and other consumables specific to one or more Siemens and GE engines (Fig A1).

Repair capabilities are enabled by state-of-the-art welding and machine tools. Personnel have expertise in TIG, gas metal arc, and shielded metal arc welding. Tooling for the new shop includes form and fit and dimensional-check fixtures for all major components, four-axis EDM, horizontal and vertical boring mills, large lathes, etc. State-of-the-art tooling and experienced personnel assure quality turbine

turbine blade/bucket repair, including tip and angel wing restoration; vane and nozzle repair with DSD correction; complete restoration services for combustion liners and TPs; restoration of compressor blades and diaphragms; welding, heat treatment, and machining of nozzle support and vane segment rings; shroud block and ring segment repairs, etc. Specialties include repair and refurbishment of W501F combustion baskets and R1-R4 blades and vanes for the W501AA and the W501D5-D5A. For GE Frames 3, 5, 6, and 7B-EA, repairs of Stage 1, 2, and 3 nozzles and buckets, as well as of liners and transitions, include full dimensional and metallurgical inspections for all components (Fig A2). Downstream deflection correction, radial and axial packing seal replacement, airfoil thickness verification, multiple-segment fixturing for accurate shop assembly, and area and harmonics analyses for all stages are part of the nozzle overhaul experience. Chemical and mechanical coating removal, eddy-current verification of cooling-hole wall thickness, "Z"-notch restoration, and OEM-equivalent coatings highlight the company's bucket restoration effort.

Small engines. Of particular interest to GT users at commercial, institutional, and small industrial plants is that Phoenix Turbine repairs and refurbishes parts of Ruston TB500 and TB5400 engines, Siemens' Tornados and Typhoons, and Solar Centaurs. Located only 20 miles from Sky Harbor International Airport, the company is able to cherry-pick services from local shops working primarily in aviation to further expand its repair offerings. Like Harrison says, "Phoenix is a GT town." **ccj**



A1. Standing inventory of 501AA diaphragms, DF42 baskets for Westinghouse engines, and 501B fuel nozzles (left to right) **A2. Phoenix Turbine's** new combustion repair and manufacturing cell (right)

