

# COMPLETE NEW FCC EXPANDER SPARE RBSA

*By Don Shafer*

One of our FCC Expander customers contracted RMS to provide a completely new, spare Rotor, Bearing and Seal Assembly (RBSA). They were experiencing high vibration levels on the unit in-service and also a chronic seal housing and inner exhaust casing horizontal joint leaking issue. The joint leakage was impacting the overall safety and reliability of the unit as well as making it impossible to take on-line blade photographs. The existing unit also had experienced several oil leaks.

RMS proposed the solution to the customer of having a spare RBSA. The spare assembly would utilize their existing spare rotor assembly. The spare RBSA would be manufactured and assembled while their current unit was running and would not impact operations at the refinery.



Figure 1

The customer also requested that RMS perform a power balance analysis for the power recovery train and provide a new Integral Stator Shroud. The goal was to evaluate whether additional power recovery from the expander was available. These results were used in the design of the new Integral Stator Shroud.

The work scope for the spare Rotor Assembly included cropping and coating a set of spare rotor blades the customer had in inventory. These were cropped to match the new RMS optimized integral stator shroud and installed in the RMS refurbished rotor assembly. The re-bladed rotor assembly was balanced and prepped for installation into the RBSA.

The new RBSA incorporate the latest design features for the inner exhaust casing and seal housing. The primary upgrade for the inner exhaust casing and seal housing was to increase the size and number of fasteners at the horizontal joint to address the existing unit's leakage issue. The new assembly incorporated new, redundant, vibration and speed pick-up instrumentation. All of the instrumentation was moved internal to the bearing housing to improve the reliability of these critical equipment health monitoring instruments.

The new bearing pedestal fabrication and machining

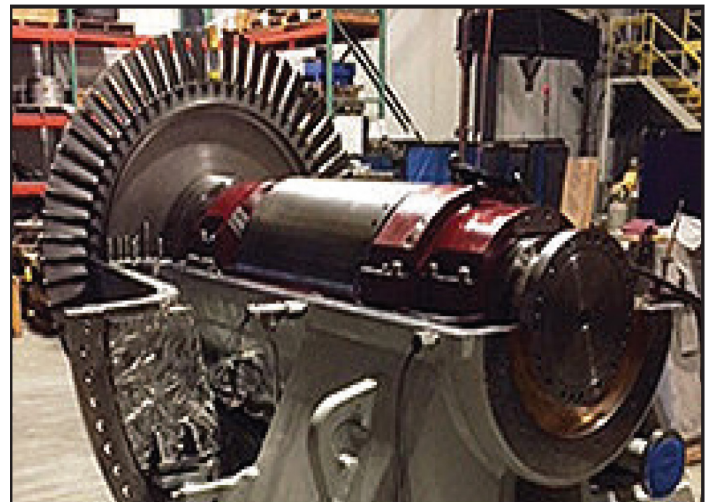


Figure 2

were optimized for ease of manufacture and assembly.

All new bearings were provided except for the existing spare active thrust bearing that the customer elected to use. Every seal, fastener and other internal components were upgraded to the latest designs.

The RBSA was assembled with the rotor installed. All critical clearances and fits were verified and recorded to the document the final as-built condition of the assembly.

Due to the poor condition of the in-service rotor, bearing and seal assembly, RMS was asked to compress the schedule of the new spare RBSA. RMS was able

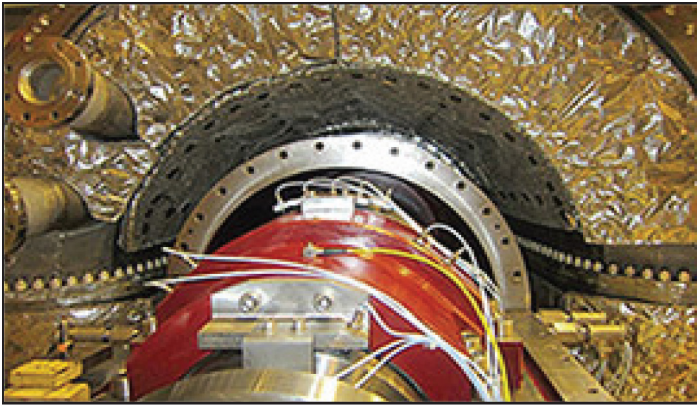


Figure 3

to achieve this and ship the completed assembly, with rotor installed, 6 weeks early with no additional cost to the customer.

The spare RBSA was installed in early December of 2017 and is operating per design with low vibration levels and no leaking joints.

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