

RMS REPLACES COOPER COMPRESSOR RC20-17 ROTOR

By Dirk Paraschos

RMS was offered a unique challenge to replace in-kind a Cooper compressor RC20-17 rotor that suffered a heavy rub failure caused by the impellers contacting the diaphragms. The real challenge was the time in which the project was to be completed.

RMS proposed to reverse engineer and manufacture a new rotor in 14 weeks to meet the needs of the customer. The process of reverse engineering was a difficult task due to the severity of the rub damage to the impellers and the fact the rotor was received fully disassembled.

The scope of supply consisted of new shaft, (2) new one-piece impellers, impeller over speed spin test, new balance piston, new shaft sleeves, rotor assembly and low speed balance, development of performance curves and to perform a rotor dynamic analysis of the existing design.

RMS was able to meet the challenge of completing the rotor on time by utilizing the combined experience

of our professional project team (product engineers, aerodynamicist, project manager, drafting and purchasing), our expanded shop capabilities, and vendor support network.

In less than 4 weeks, the impellers were reversed engineered through mechanical and Faro Arm Inspection methods. The inspection information was analyzed by the engineers. AutoCAD and Solid Works models of the impellers were created. Utilizing forging material from our in-house stock we were able to begin the 5 axis machining of the impellers and create a finished product, including over speed testing, in less than 8 weeks.

The engineering of the shaft, shaft forging, final machining and grinding was also completed in less than 12 weeks.

The rotor was assembled, balanced and shipped in thirteen weeks, one week ahead of the very tight 14 week schedule.



Figure 1

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