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Variable Inlet Guide Vane (VIGV) replacement with the rotor in place

Applies to: General Electric Model Series MS5001, 6001 and 7001

If you have a GE gas turbine with variable inlet guide vanes (VIGV), it is possible to change out the vanes and/or replace the bushings without removing the rotor!



Fig. 1: Typical Variable Inlet Guide Vanes (VIGV) showing inner bushing blocks and dowels

Contrary to the opinion of many, including the OEM, it is not necessary to remove the turbine/compressor rotor (or compressor rotor on the MS7001) to gain access to the lower half. Charlie Pond, Partner, Pond And Lucier, LLC, developed a process to perform the vane removal in the lower half and has successfully changed out VIGVs on all of the aforementioned turbines. With the upper-half compressor inlet bellmouth casing removed, it is relatively easy to accomplish this work on the larger **MS7001** gas turbines. On the **MS6001**, the working

space is significantly reduced in the lower half of the compressor in the region of the VIGV. Furthermore, the *MS5001* is very restrictive, especially in the removal of the original dowels of the inner bushing blocks.

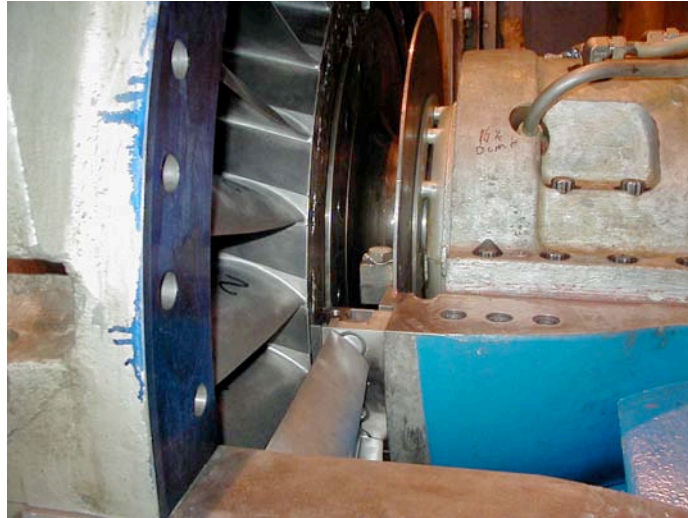


Fig. 2: Typical VIGV showing first-stage compressor rotor on left

The procedure requires special tooling developed by Pond, physical dexterity with both hands (having to work on both sides of the machine) and extreme attention to detail to accomplish the task. And a lot of patience helps too! The inner bushing material is made of *Chemloy*. Although it does not readily seize, as was the case with the older style bushings, the material does wear out much more quickly, requiring replacement.



Leading edge of VIGV with compressor rotor blades (damaged) in background

Operation with severely worn bushings is hazardous, because the vanes can vibrate and fail prematurely due to high-cycle fatigue. Changing the VIGVs with the rotor in place can save upwards of \$200,000 by avoiding the need to do a major tear down of the gas turbine. Also, on older units that do not have the C-450 “High Flow” IGV’s, it is wise in most cases to convert to the high flow IGVs during this outage.



Charlie Pond setting IGV angles inside inlet bellmouth of MS6001B gas turbine



IGV angular position indicator and pointer

For more information or a detailed proposal to accomplish the work described above, please contact Charlie Pond of *Pond And Lucier, LLC*.