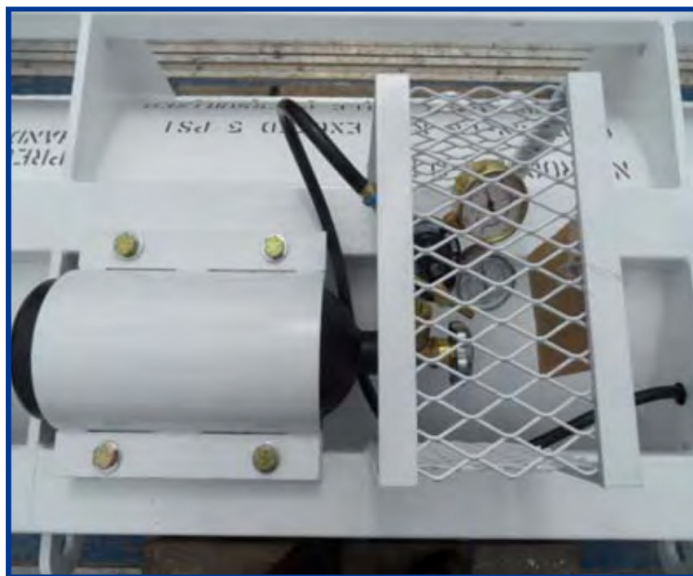


NITROGEN PRESERVATION SYSTEMS FOR ROTOR CANISTERS

By Marc Rubino

In the turbomachinery industry, it is critical to protect and maintain spare rotors to ensure the capability of immediate installation. All components including the shaft, turbine disks or compressor impellers, the thrust collar, any sleeves, etc. are subject to damage when stored in an area without environmental control. Due to the immense capital invested in rotors, it is necessary to provide a robust and secure storage structure. The structure would ideally provide adequate support for the rotor's static weight, sufficient protection from foreign contaminants such as dust, the minimization of rusting agents, and a rigid exoskeleton to prevent trauma to the rotor.



Due to the many advantages, rotors are frequently stored in fabricated steel canisters. These containers provide significant protection during either shipping or storage. They are also constructed to enable the container to be stowed vertically. As a result, the risk of rotor bowing is prevented that would otherwise occur during long-term horizontal storage. In the horizontal position, the rotor would sag and detrimentally affect API level rotor balance.

Although these containers are closed structures, there

is still potential for contamination from outside air including dust and humidity. Consequently, the steel rotor parts would be in the presence of moisture and react with oxygen causing material corrosion. To combat rust and debris, rotors are often coated with preservatives. Depending on storage time, preservatives can range from WD-40 to LPS Labs corrosion inhibitors to Cosmoline.

Due to the gelatinous nature of heavier preservatives, they are difficult and time-consuming to remove from rotors. The premier solution, then, for rotor preservation is a nitrogen purge system. Nitrogen functions as an excellent alternative to physical coatings as removal is not required prior to operation. Accordingly, rotor canisters are frequently equipped with a nitrogen purge system.

As the name implies, the system purges atmospheric air and replaces the volume of sealed rotor containers with commercially pure nitrogen. The rotors are then suited for long-term storage without excessive surface preservation.



RMS was recently contracted to perform inspections for two rotors, a steam turbine and centrifugal compressor, for an oil refinery in Canada. An additional aspect of the work scope was to retrofit the accompanying storage containers for each rotor with a nitrogen purge system.

Both canisters were first modified by welding on custom support brackets and clamping saddles for the nitrogen tanks. An expanded metal mesh cage was also welded on by RMS staff to protect and maintain visibility of the dual pressure gauge regulator on the nitrogen tanks. Both rotor containers were then sandblasted and painted with a corrosion resistant epoxy. After installing all hoses, fittings, valves, and gages, both containers were pressurized with nitrogen to 5 psig to test for gas leakage. After passing leakage tests, the rotors were placed back into the containers and readied for shipment. In summary, both rotor containers were successfully modified with nitrogen purge systems with rigid, yet aesthetically pleasing construction and avoided the recurring cost of off-site storage.

For more information:

Marc Rubino

Email: mrubino@rotatingmachinery.com

Tel: 484-821-0702

Headquarters

2760 Baglyos Cir.
Bethlehem, PA 18020

Houston Office

16676 Northchase Dr., Ste 400
Houston, TX 77060



rotatingmachinery.com

Tel: 484-821-0702

Parts: rms@rotatingmachinery.com

Rotating Machinery Services, Inc. | 2760 Baglyos Circle, Bethlehem, PA 18020 | Tel: 484-821-0702