

INLET AIR FILTRATION SYSTEMS

By Tony Rubino, P.E.

Inlet air filtration systems are critical to sustaining long term compressor performance and reliability. Unfortunately, these same systems, if not properly maintained, can eventually contribute to poor compressor performance and possibly even compressor failure. Filters that are not renewed on a methodical basis can reduce compressor efficiency in numerous ways:

- Excessive pressure drop requiring increased pressure ratio by the compressor
- Excessive pressure drop causing implosion door to open allowing entry of unfiltered air and possible foreign objects
- Accumulated debris “washing” downstream during heavy rainstorms.

Filtration system components are susceptible to corrosion and fatigue mechanisms which can lead to breakage and possible ingestion into the compressor. Below are photographs from three different compressor installations. In these cases, filtration system components were not satisfactorily inspected during turnarounds and led to foreign object entry into the compressor. Fortunately for two of the three end users, only one resulted in airfoil failure.

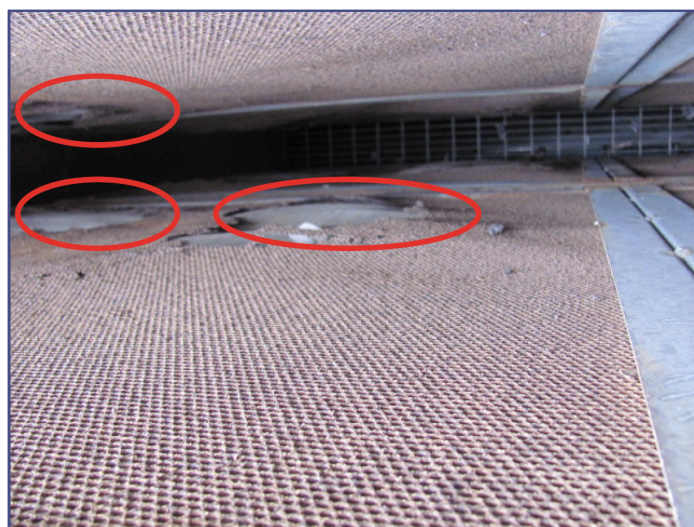


Figure 1: Note torn screen encapsulating the silencer material. The screen material was found at numerous locations in the flow path.

Specification of corrosion resistant materials is highly recommended during the procurement of a filtration system. Even more critical, the thorough inspection of inlet system components (especially filter frames, retention hardware, debris screens, implosion doors, etc.) should be planned and executed with the same rigor as the turnaround of the turbomachinery.



Figure 2: A section of inlet silencer screen was found near the inlet guide vanes.



Figure 3: The arrow points to pulverized screen material that was centrifuged by the rotor and deposited on the stationary surfaces including variable guide

For more information:

Tony Rubino, P.E.

Email: trubino@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