

Case Study 24

Steam Turbine Oil Mist Eliminator for Reservoir Vent

Background

In the energy sector of our economy, midstream, downstream and power generation are all struggling to comply with evolving OSHA/EPA regulations. One common issue they all have is oil mist emissions from turbines, generators, compressors, reciprocating engines and gearboxes that require oil lubrication. As the oil is dispersed on internal surfaces, the mechanical interaction of high-speed components, along with elevated operating temperatures, causes the oil to shear and atomize creating a pressurized vapor. If this pressure is not vented, it can force oil to leak through shaft seals and cause extensive damage. Traditionally, these systems were vented to atmosphere with little or no thought to environmental impact. Older technologies like knock-out drums, plate and mesh type separators can retain bulk oil and large droplets but are not effective at capturing fine aerosols. Northeast Filter was contacted by a cogeneration power plant with concerns about residual oil formation on the side of their building and offer options to eliminate it.

Solution

After touring the facility we observed that their steam turbine lube oil reservoir was vented through the top side of their building with a visible smoke. An old mesh style “vapor extractor” system was installed when the plant was built but is very difficult to access and has never been opened or changed. They showed us a spare mesh pad from their stores but were not sure how to change it without removing piping. We quoted a highly efficient, blower assisted oil mist eliminator system with synthetic coalescing elements sized for the turbine/reservoir and fully compliant with the Clean Air Act and RICE NESHAP. The blower ensures a constant negative pressure on the reservoir to avoid over pressure concerns with a built-in bypass and check valve in the event of system failure and to prevent back pressure. The oil collected is drained back to the reservoir to minimize oil loss. After the unit was installed the difference was apparent with no smoke visible at the outlet port. The building was cleaned immediately after installation, and it is still clean 6 years later!



Before Installation



After Installation



This case study is an original work of Northeast Filter & Equipment Company (Northeast Filter). Any copying or other use by any other party is prohibited without the express written permission of Northeast Filter.

©2020 Northeast Filter & Equipment Company. All Rights Reserved.