ISOPur

Case Study

Pure Servo Valve - Gas Turbine

ISOPur Fluid Technologies eliminates Moog servo valve varnish problems on low pressure hydraulic, GE Nuovo Pignone Gas Turbine fuel control

GE Services operates three GE Nuovo Pignone PGT-5M Gas Turbines fueled by natural gas at Yale University in New Haven, CT. Each turbine drives a 6.2 megawatt synchronous generator. Each gas turbine contains a single lube oil sump (Mobil DTE Oil Light) that is used to lubricate the gas turbine and generator; and act as the hydraulic oil which powers Moog 770 Series electro-hydraulic servo valves that control the turbine and fuel flow.

The Challenge

The turbine is configured to use oil for lubrication and hydraulic service thereby causing servo valves to experience increased failures related to contamination, varnish, and erosion. One servo valve failure was occurring every two months, and the frequency of failure was increasing. Because servo valves are comprised of numerous parts which fit together with only a few microns of clearance, the margin for contamination buildup is extremely small. Any interference causes a discontinuity between the control signal and output, which destroys precise regulation. The use of fine filters could not eliminate the varnish components and the installation of a separate hydraulic fluid system was an expensive alternative. GE Services made the decision to try ISOPur based on the Balanced Charge Purification (BCP) technology in the hopes that it could solve their varnish problems.

The Solution

GE Services installed three ISOPur fluid purification systems to solve these costly servo valve issues. The ISOPur units were connected to the flushing taps on each lube/hydraulic reservoir. Immediately following installation of the BCP technology on the three gas turbines, there was a positive effect not only on the servo valves but the entire turbine lube oil system. Data showed a dramatic reduction in large and small particulate contamination in the oil. In addition, the physical condition of the fluid has continued to improve as indicated by the stabilization of all relevant oil parameters. The reduction of water content to impressively low levels has ensured stable and beneficial lubricant performance. The BCP technology scrubbed the remaining contamination from the system as indicated by oil test values returning to new oil standards. With all varnish and debris removed from the hydraulic system, this critical machinery has been able to function securely and reliably. The net result has been a dramatic reduction in servo valve issues with failure rates continuing to drop. Within six (6) months, the servo valves are expected to be problem-free.

The Return on Investment

Several years prior to the ISOPur installation, the turbines had demonstrated one servo valve failure every two months due to deposits. Todd Nass, the plant service engineer noted, "Operation since July has been trouble free. We are quite pleased at this point, but the one year trouble free point will be the proof of this system." Oil quality issues have all but been eliminated, resulting in a huge return on investment.

"Operation since July has been trouble free. We are quite pleased"

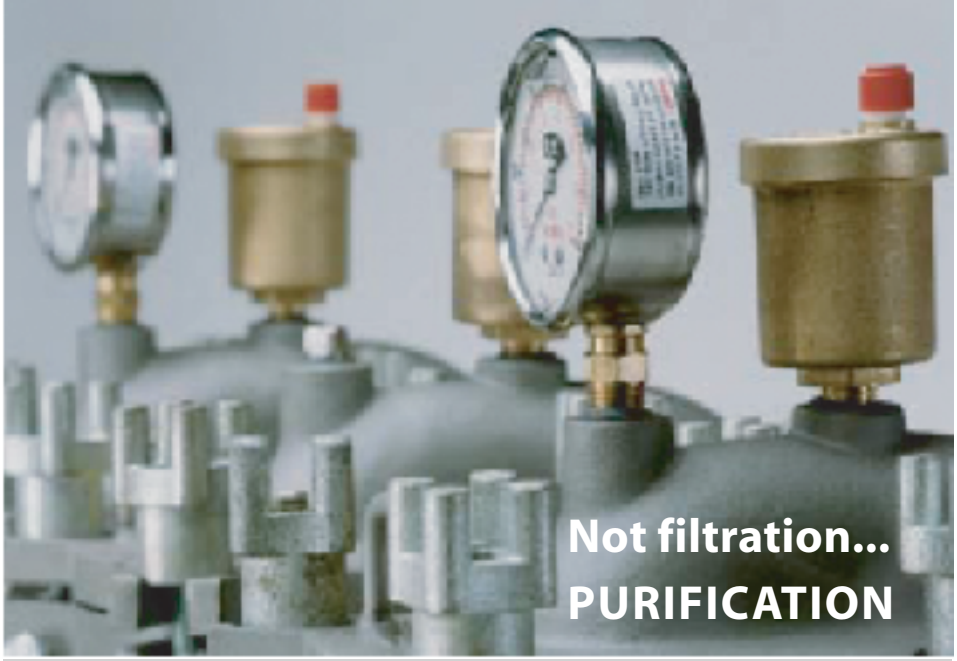
- Todd Nass,
GE Services Plant Service Engineer

Before *ISOPur:*

- *Servo failure every 2 months causing shutdown*
- *Expensive fine filters that were unable to solve the problem*

After *ISOPur:*

- *Eliminated servo failures*
- *Removal of varnish and debris*
- *Significant oil quality improvement*
- *Reduced water content*



ISOPur Fluid Technologies, Inc. develops advanced purification systems for hydraulic oil, lubricating oil, and diesel fuel used in high-performance, mission-critical industrial machinery. Through its patented Balanced Charge Purification (BCP) technology, ISOPur is able to achieve a level of fluid purity unattainable by traditional filtration or centrifugal systems. ISOPur not only continuously purifies oil and fuel to a better than new condition, BCP also scours the internals of the machinery as well. ISOPur can provide a dramatic return on investment by improving plant uptime, reducing maintenance costs, extending the life of expensive capital equipment, and reducing fluid consumption and waste disposal.

ISOPur is committed to defining the fluid purification industry. In an effort to conserve what is quickly becoming a capital resource, non-conducting fluids, the ISOPur BCA technology is able to keep these fluids like new, year after year - *without replacement*.

Discover the **Power of Purity** with ISOPur Fluid Technologies.

ISOPur

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