

CRITICAL VARNISH DEPOSITS REMOVED WITH ZERO DOWNTIME FROM SOLAR TITAN 130 TURBINE

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Case Study

SYNOPSIS

Varnish deposits in a municipal plant's turbine threatened system internals if not addressed. Using a resin-based polar attracting technology and an in-line varnish adsorption skid, the RIG team was able to remove the deposits and lower oil contamination to acceptable levels. This was achieved with the system online and no interruptions to daily plant operations.

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RIG's Varnish Absorption System. RIG deployed filtration equipment and a certified plant maintenance technician to perform the in-line filtration.

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INTRODUCTION

A joint municipal plant's turbine generator showed critical varnish deposits during a turbine lubricant analysis. To remove the varnish, Solar and the municipal plant contracted the Reliable Industrial Group (RIG) team to remove the varnish deposits.

The scope of the project consisted of providing experienced personnel, equipment and materials needed in executing varnish mitigation strategies on a Solar Titan 130 lube oil system. RIG's experts recommended an in-line varnish mitigation strategy that could be performed with the system online but still ensure target ISO cleanliness levels were achieved for all 900 gallons of turbine lubricant in the Solar Titan 130 lube oil system.

METHOD

RIG deployed filtration equipment and a certified plant maintenance technician to perform the in-line filtration. The full service package included:

- Installation of RIG's varnish absorption system (VAS) to run side stream filtration
- Training of onsite personnel to monitor and operate the VAS so inline filtration can be run as needed by plant staff to achieve and maintain target ISO cleanliness levels.
- Instructions and sampling bottles with shipping labels for oil analysis to independently verify ISO cleanliness levels.

The varnish absorption method used by RIG is a resin based polar attracting technology. Our 10 GPM VAS system is designed for reservoirs up to 5,000 gallons. The VAS equipment has the following specifications:

- A dual varnish absorptive housing – 20" diameter x 40" long which leads into a
- A 640-series pleated micro-glass filter housing

- Two varnish removal elements with 5,000 gallons of turbine oil, which are designed to lower varnish MPC value from MPC=42 to <25MPC
- Two additional elements may be required to bring down to <15 MPC.
- In applications where water is greater than 500PPM, a vacuum oil purifier can be added on to lower dissolved water to less than 100PPM

FINAL RESULTS

RIG was able to perform the varnish mitigation services with the system online. The critical varnish deposits were removed, and the particle count was lowered from a 16/15/11 to a 15/14/10 during the same timeframe utilizing the Varnish Adsorption Skid. This was achieved without interrupting plant operations and prevented any unscheduled downtime due to varnish contamination while also extending the life of the lube oil.

VARNISH PREVENTION RECOMMENDATIONS

After completion of the project, RIG recommended the plant incorporate regular varnish testing into their annual analysis to prevent unscheduled downtime in the future. Varnish can pose a series threat to system internals and sensitive parts over time.

RIG recommends that every facility perform annual turbine oil analysis that includes varnish potential testing for critical systems. In addition, RIG recommends incorporating oil filtration and reservoir cleaning into maintenance turnaround schedules to prevent unscheduled downtime due to lubrication cleanliness. If you would like to learn more about varnish and varnish mitigation techniques please visit: <https://therigteam.com/experience/whitepapers/>

For additional information on RIG's lubrication services and more please visit www.therigteam.com and follow us on LinkedIn at <https://www.linkedin.com/company/reliable-industrial-group>

SIDE-BY-SIDE LAB ANALYSIS



Figure 1. Original Lab Analysis Membrane Patch Colorimetry MPC 62



Figure 2. After - MPC Value: 10

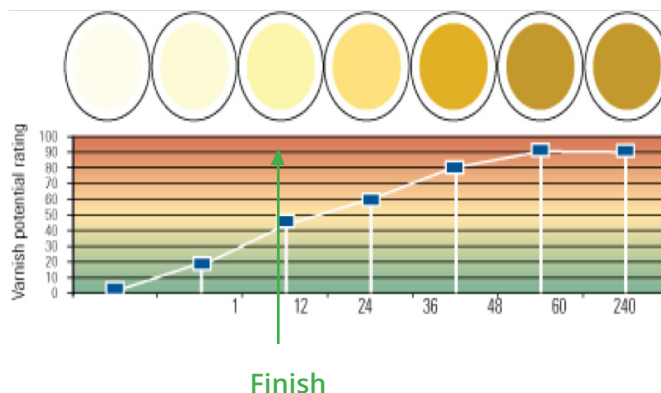


Figure 3. Varnish Potential Rating



RIG works across many industrial service disciplines. These include Hydrolazing, steam/air blows, chemical cleaning, varnish mitigation and oil flushing. Contact us for more information:

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