



CLEAN OIL
BRIGHT IDEAS

Application Study
written by:

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CJC™ Application Study

CUSTOMER

Major U.S. Refinery
The refinery processes over 240,000 barrels of crude oil a day.

THE SYSTEM

Dresser-Rand 28 MW TG 800
Steam Turbine Generator Set
Oil Type: ISO VG 32 Turbine Oil
Oil Volume: 1,000 gallons (3,785 L)

THE PROBLEM

Varnish contamination had caused hydraulic and servo valve sticking as well as bearing failures in several turbines. Another problem was that start-up and commissioning of new turbines was delayed for weeks as third party contractors were hired to perform oil cleanup. So a filter system was needed for a new steam turbine that would (1) remove organic varnish precursors from in-service oil, and (2) perform fast oil system clean up after construction.

THE SOLUTION

A CJC™ Fine Filter type HW 427/108 (Welded Base) was selected with 16 x CJC™ BLAT 27/27 Filter Inserts.

The filter is set up to run in two modes:

- Normal - 18 gpm (4,088 L/h)
- Cleaning/Filling - 50 gpm (11,355 L/h)

THE RESULT

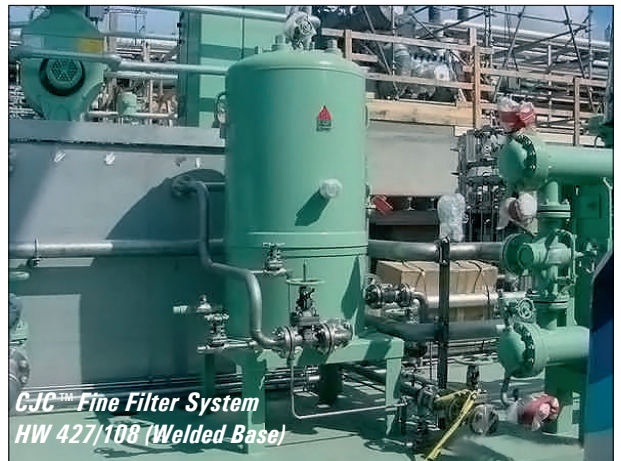
In an isolated test the varnish potential was reduced by 87% in just 24 hours. The particle count improved by 3 ISO Codes. This represents oil that is 8 times cleaner and results in a life extension factor of 2.

COMMENTS

"We have been advocating these secondary kidney filters for 2 years. The filters have value for varnish removal to keep in-service oil clean, which is a major concern of us reliability engineers, and fast oil system cleanup after construction, something our project and operations people highly value... this unit will greatly reduce clean up time and/or eliminate the need to hire rental equipment and contractors to do oil cleanup. Purchase justification is based on commissioning time savings alone, not varnish removal."

Lube Oil Steam Turbine, Oil Refinery

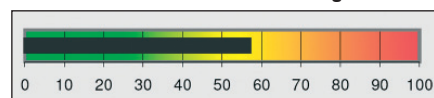
Refinery Overview



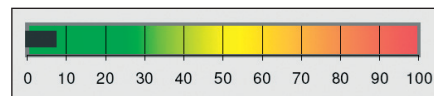
CJC™ Fine Filter System
HW 427/108 (Welded Base)

OIL SAMPLES

Varnish Rating - 57



Varnish Rating - 7



RESULTS

Filtration Time	0 Hours	24 Hours
> 4 μm	647	89
> 6 μm	251	34
> 14 μm	19	2
ISO Code	17/15/11	14/12/8
Varnish rating	57	7
Membrane Color	Yellow Brown	White