CLEAN OIL
BRIGHT IDEAS

Lube Oil
Gas Turbines, 2xGE 84 MW, CCCP Power Plant

CJC™ Application Study

Application Study written by:

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CUSTOMER

Energyworks Cartagena - Iberdrola, Spain.
Cogeneration combined cycle power plant inside SABIC refinery.

SYSTEM

Cogeneration combined cycle power plant of 95 MW.
2 x GE gas turbines of 42 MW.

Installed:	2002 GE heavy-duty gas turbines 6B
Lube oil:	Mobil DTE 832 in operation since March 07
Oil reservoir:	6,500 L
Operating temp.:	65-85ºC

PROBLEM

First varnish problems caused turbine trip due to malfunction of IGV servo valve hydraulics.
High MPC (Membrane Patch Colorimetric) value of 55 ΔE indicating risk of varnish problems as result of turbine oil degradation.

SOLUTION

CJC™ Varnish Removal Unit, VRU with **CJC™ Varnish Removal Insert, VRi 27/27.**

RESULTS

The MPC dropped from 55 to 15 within 30 days. No varnish contaminants on the inline filters after the filtration with the CJC™ VRU.

BENEFITS & SAVINGS

The CJC™ VRU avoided not only the oil change but also possible turbine trips. To change 6,500 L of Mobil DTE 832 mineral oil cost approximately **12,000 EUR.** Adding flushing and oil disposal cost, it sums up to roughly **15,000–18,000 EUR for an oil change.**
In a cogeneration power plant the gas turbines form part of a complex energy production supply chain and any downtime will immediately result in very high costs. If one turbine stops, the plant loses energy worth **more than 3,000 EUR per hour,** plus the loss of steam production. Not to mention possible penalties to pay.

ENVIRONMENT

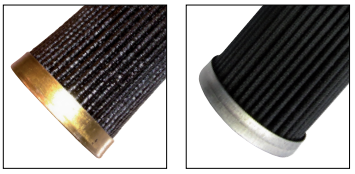
From the environmental point of view the benefits are very clear. Without the CJC™ VRU the power plant would have changed the oil after **only 4 years** in use, which is a short time considering all the costs that go into extracting the crude oil, refining, blending and shipping etc. In a real sustainable solution, utilizing the CJC™ VRU, **the oil is able to last 10 – 20 years in operation without compromising its properties.**

COMMENTS

Mr. Juan Alberto Martinez, Maintenance Manager Iberdrola Energyworks Cartagena:
"The VRU system has removed our varnish problems, completely."

CJC™ Varnish Removal Insert, VRi after 30 days of operation

Samples taken, before and after filtration with the CJC™ VRU



Varnish coated in-line filter of IVG servo valve hydraulics, before and after filtration with CJC™ VRU

MPC dropped from 55 to 15 after 30 days of filtration

RESULT

	Before CJC™ Filtration	After 30 days CJC™ Filtration
MPC, ΔE (Membrane Patch Colorimetric)	55	15

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