CLEAN OIL
BRIGHT IDEAS

Lube & Hydraulic Oil
GE 6FA+e Gas Turbine, Bearing, Load Gear and Control

CJC™ Application Study

Application Study written by:
Jan Foged
C.C.JENSEN Ireland

In co-operation with:

Mr. Sean Ryan
Power Plant Engineer
Rusal Aughinish Alumina

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2015

THE CUSTOMER

Rusal Aughinish Alumina, Askeaton, Co. Limerick, Ireland.

THE SYSTEM

System: GE 6FA+e Gas Turbine
lube & hydraulic oil
bearing, load gear and control
Oil Type: Castrol Perfecto XPG 32
Oil Volume: 21,500 ltr

THE PROBLEM

Secondary fuel operation was unreliable. The liquid fuel control valve operation was erratic and the stop valve continually failed to open within a 4 sec limit, often resulting in a trip. Given the standby nature of the liquid fuel system, the oil supply to the control and stop valves cools over time. Oil analysis from 2014 and 2015 had shown a variable MPC, with traces of varnish observed on the liquid fuel servo valves and trip cartridges.

THE SOLUTION

CJC™ Filter: Varnish Removal Unit, VRU 27/108
CJC™ Filter Insert: 4 off VRi 27/27

THE TEST

It was agreed with the customer to run with the VRU for a period of 6 months to monitor the varnish levels (MPC value). The trial commenced on 21.05.2015, with an initial MPC inlet value of 38.2. Two additional samples were taken 3 hours later which yielded an MPC inlet value of 40.4 & 3.8 on the outlet. A set of inlet & outlet samples were taken every month to monitor the progress. The customer also tested the operation of the LF stop valve during this time. On the 18.08.2015, the top VRi 27/27 Filter Insert was replaced to get an idea of the contamination that had been removed.

THE RESULT

The MPC analysis was carried out by CCJ Laboratory and the results are detailed opposite. The final inlet sample was also tested by 2 independent laboratories and both results were within +1.4 MPC of the CCJ results.

THE BENEFITS

In August, 3 months after the installation of the VRU, the customer changed the liquid fuel servo valve and trip cartridge during a planned outage and resumed fuel swaps. Between August and December 2015, 5 successful swaps were completed with no trips.

The tests on the stop valve clearly showed a marked improvement in operation, with response times reduced to under 1 second.

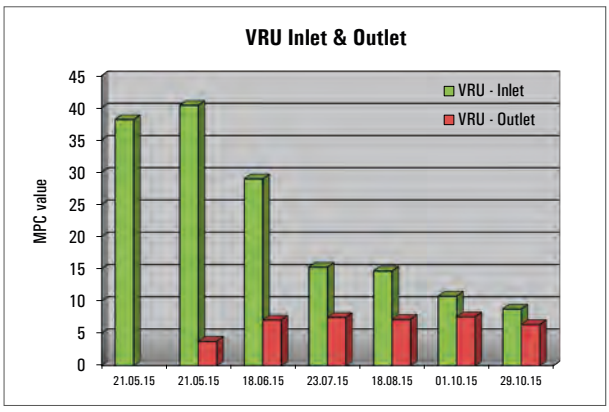
A split-up CJC™ VRi Filter Insert disk, revealing how the contamination is absorbed into the celloluse

One CJC™ VRi Filter Inserts was replaced on the 18/8

THE RESULT

Date	Inlet VRU	Outlet VRU
21.05.2015, before filtration	38.2	-
21.05.2015, after 3 hours	40.4	3.8
18.06.2015	29.0	7.1
23.07.2015	15.3	7.5
18.08.2015	14.7	7.2
01.10.2015	10.8	7.6
29.10.2015, after 5 months of filtration	8.8	6.4

Analysis taken by CCJ Laboratory



COMMENTS

Mr. Sean Ryan, Power Plant Engineer Rusal Aughinish Alumina:

"The CJC™ VRU has proved a very effective and reliable unit in reducing the varnish levels in a short period of time. The decrease in MPC has been backed-up by the improvements seen during liquid fuel operation."

C.C.JENSEN A/S
Løvholmen 13 • DK-5700 Svendborg • Denmark
Phone: +45 6321 2014 • Fax: +45 6222 4615
sales@cjc.dk • www.cjc.dk