CLEAN OIL
BRIGHT IDEAS

Hydraulic Oil
Speed Control System, Hydro Turbine

CJC™ Application Study

Application Study written by:

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Endesa Generación

2002

endesa generación

CUSTOMER

ENDESA GENERACIÓN SA (Girona, Spain). On the Ter River, ENDESA has 10 hydroelectric generation stations and 7 mini hydroelectric stations.

THE SYSTEM

System for the speed control and hydraulic regulation of the hydro turbine type ESCHERWYSS of 49.1 MW.
Oil volume: 660 litres.
Type of oil:
CEPSA CIRCULANTE ISO VG 68.

THE PROBLEM

The oil in the hydraulic system in the turbine G1 was analysed and a high level of wear and tear particle contamination as well as the formation of resins (the result of the oxidation of the oil) was detected. The concentration of these resins and metallic particles was accelerating the ageing of the oil. The contamination was also causing a drastic reduction in the useful life of hydraulic and mechanical components and causing breakdowns.

As each hydraulic generation station is maintained with a minimum of personnel, the client wished to optimise the maintenance of each hydro turbine.

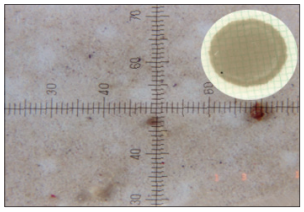
THE SOLUTION

A **CJC™ Off-line Fine Filter LG 15/25**, was installed on the hydraulic system. It has a flow of 300 L/h, filters to 3 μm absolute, eliminates resins and absorbs humidity. The dirt holding capacity is 2 litres of particles.

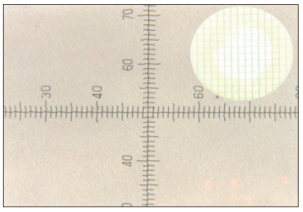
THE RESULT

A reduction in particle contamination of 100 times has been achieved, that has resulted in an increase in the lifetime of the hydraulic and mechanical components of 5 times. Not only have abrasive particles been removed, but also resins and humidity.
As clean hydraulic fluid is the key to the reliability of each turbine, the client has decided to install CJC filters to maintain the systems free of particles, resins and humidity in the hydroelectric generation stations at Susqueda and Sau (also in Girona, Spain).

Mr. Jesus Javier Moises in the hydro-electric generation station, next to the CJC™ LG 15/25 L Fine Filter.



Before filtration with an In-line Filter.



After 3 months of filtration with CJC™ Off-line Fine Filter.

THE RESULT

	Before filtration	After 1 month	After 3 month
Solid particles > 2μm	565,924	50,024	5,684
ISO code	20/17/12	16/15/9	13/12/8
Water	40 ppm	26 ppm	19 ppm
Resins (oxidation)	Colour brown	Colour white	Colour white

COMMENTS

Mr. Serrano, Co-ordinator Ter Area:
"...the CJC filters are reliable, the results achieved in the reduction of wear and tear have been impressive..."
Mr. Rosico, Hydraulic production unit - Area Ebro/Pirineo:
"The CJC filters drastically reduce the probability of bad mechanical breakdowns due to the oil. It is a solid step towards ideal proactive maintenance..."

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Power Plants
Turbine Control Systems
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