CLEAN OIL
BRIGHT IDEAS

# Turbine Oil
# Hydro Power, Governor and Thrust Bearing Systems

## CJC™ Application Study

**Application Study written by:**

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### CUSTOMER

**Hydro Power Plant** operated by the leading producer of hydroelectric energy in the United States.

### THE SYSTEM

7 x 53 MW Francis Turbines.
Governor Oil / Thrust Bearing Systems.
**Manufacturer:** Voith Siemens Hydro
**Oil Type:** Turbine Oil, ISO VG 68
**Oil Volume:** 1,000 gallons (approx. 3,785 L)

### THE PROBLEM

Management embarked on a multi-year project to rehab the 48 year old hydro power plant. Life extension and the use of environmentally friendly Francis runners were the key objectives. The replacement contract included 7 turbines with new digital governors.

Project Engineers understood from experience that the new digital governors would be more sensitive to fine particles and the potential for varnish would be greatly increased when using Group II oils.

### THE SOLUTION

A **CJC™ Fine Filter HDU 27/54 MZ-EH1PT**, processing 5 gpm (approx. 19 L/min.) with an MZ-16-4 Pump. This system was selected for its efficiency in maintaining the oil free of particle and varnish in the commissioning and operation phases. The system features 2 **CJC™ Filter Inserts B 27/27**, rated at 3-micron absolute. The Filter Inserts also have the capability of removing varnish by adsorption, approximately 16 pounds per set.

### THE RESULT

The contamination level on one turbine prior to commissioning and start up was ISO 20/15. Afterwards the level improved by 8 ISO Codes to ISO 11/7. **This translates into a life extension factor of 9 and the cleanliness level improved by a factor of 256**. No significant levels of varnish have been detected in the oil since start up.

### OIL SAMPLES

| TEST SAMPLE | BEFORE | AFTER |
|---|---|---|
| ISO Code | 20/15 | 11/7 |

*View of Power House from Observation Deck*

*CJC™ Fine Filter HDU 27/54 MZ-EH1PT*

*Varnish Removal from Governor System*

*This picture illustrates how effectively the CJC™ Filter Inserts remove varnish and particles from the oil*



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