CASE STUDY

Power Generation

Hydroelectric Oil Filtration

KAYDON FILTRATION WAS CONTACTED BY A LARGE HYDROELECTRIC DAM IN THE SOUTHEAST U.S. TO PROVIDE OIL FILTRATION EQUIPMENT FOR THE GOVERNOR OIL, GUIDE BEARING OIL SYSTEM, THRUST BEARING OIL, AND SPHERICAL VALVE OIL.

KAYDON FILTRATION
Filtration Group®

BACKGROUND

Kaydon Filtration was contacted by a large hydroelectric dam in the southeast U.S. to provide oil filtration equipment for the governor oil, guide bearing oil system, thrust bearing oil, and spherical valve oil.

Each of these systems required a separate oil filtration system. The thrust bearing oil reservoir and the spherical valve oil reservoir required quicker water removal capability. The governor oil system and guide bearing oil systems required less water removal capability. After reservoir sizes were established and design input gathered, the Turbo-TOC coalescing system was recommended for the thrust bearings and spherical valve and the Model KP10 filtration system was recommended for the governor and guide bearings.

Eliminating contaminated oil, which is responsible for 70% of all problems associated with hydraulic and lube oil component failures, is a vital part of maintaining equipment up-time and preventing unnecessary maintenance work. Water is the most dangerous contaminant, and if not removed can cause more damage than particulate contamination. According to ASTM D- 4378-03, 100 ppm (0.01%) water content in the oil is required. In this case, equipment such as centrifuges are not helpful since they can only remove water to 500 ppm.

BENEFITS OF CLEAN OIL

1. Reduces failures caused by contaminated oil
2. Increases performance of equipment
3. Extends oil life
4. Reduces maintenance intervals

EQUIPMENT DESCRIPTION

Governor Hydraulic Oil System
The primary purpose of a governor for a hydroelectric unit is to control the speed and loading of the unit. It accomplishes this by controlling the flow of water through the turbine.

Guide Bearing Oil Reservoirs
Typically two guide bearings are used with a hydroelectric turbine shaft and it has its own separate, self contained lube oil reservoir. They are provided for maintaining the alignment of the shaft.

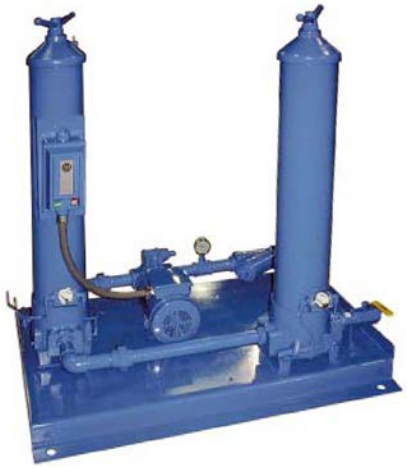
Thrust Bearing Oil Reservoirs
These bearings are the most important bearing in the turbine assembly because it carries the weight of the turbine shaft.

Spherical Valve
These valves are typically used as water shut-off valves and pump valves. The spherical valves consist of the valve housing with flanges, valve rotor, bearings and seals. The control system is nor- mally an oil hydraulic pressure system.

Features of Kaydon Filtration Equipment:

1. Filtration to ISO 16/14/11 oil cleanliness code
2. Water removal to 100 ppm or less
3. Oil warming capabilities (Turbo-TOC system)
4. Simple skid-mounted designs

The Model KL Turbo-TOC Oil Filtration System removes both particulate and water. It uses the coalescing process for water removal. Flow rates are available at 1, 5, 10, 30, 60 & 100 gpm.



The Model KP10 Oil Filtration System operates at 10 gpm with a prefilter and a polishing filter. An optional water absorbing filter can be used in the polishing filter vessel.

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