Eco Fluid Center Ltd.

58 Garnock Avenue
Toronto, ON, Canada M4K 1M2
Phone: 416 466-3144 toll free 888 442-5008
Fax: 416 466-3807 www.fluidcenter.com

'Providing Tribological Solutions'

TECHNICAL NOTE

OEM FLUID MAINTENANCE AND OPERATING INSTRUCTIONS

RE: WESTINGHOUSE STEAM TURBINES

BACKGROUND

As equipment manufacturers gain more experience with a particular design and as they get input from users, it is expected that pertinent information will be feedback. With time revisions are also often made to the OEM (original equipment manufacturers) operating documentation, to their designs and to their fluid specifications.

The turbine manufacturers have various means of communicating this information but unfortunately it does not always get to the most appropriate person. Consequently, as part of the technical assistance provided to Forsythe fluid customers a list of known changes has been prepared. It should first be verified that these or equivalent ones have been received and then the recommendations should be compared against both the existing maintenance and operating instructions and against actual current practises.

For copies or details on any of the following or to determine if there might be others that might be applicable, please contact Siemens Westinghouse. This is because the recommendations might be different for specific units. In addition, if the material is not being sent or is not getting to the correct person in a timely manner, it might also be prudent to get this changed for any future notices.

REVISIONS

A summary of known changes relevant to the steam turbine control fluids, starting with Westinghouse E.H. High Pressure Fluid Control and Lubricating Oil Systems, I.L. 1251-3583-A, November 1969, are given below;

Westinghouse Care, Handling and Applications of Control System Fluid, I.L. 1250-3731-A, March 1969

Raised normal minimum operating temperature from 120 to 110℉.

Westinghouse Availability Improvement Bulletin, Number 8102, Electro Hydraulic Control System Tubing Inspection, June 15, 1981

Advised on the possibility of cracking and blocking of the stainless steel tubing used to supply fluid. The former was the result of stress corrosion cracking attributed to the elevated temperatures and to chlorides in the steam chest insulation material. It can reportedly occur at temperatures as low as 150℉.

The blocking of the tubing was caused by carbon deposits and resulted in the interceptor valves failing to close. This was attributed to fluid temperatures above 225℉ and to no flow in the emergency trip lines du ring normal operation.

Westinghouse Care, Handling and Applications of Control System Fluid, I.L. 1250-4290-F, January 1984

Changed approved fluid to an EHC quality rather than phosphate ester hydraulic fluid.

Westinghouse Engineering Issue Visibility Report II, July, 1990

A break in a supply line cause a forced outage and several discrepancies were reportedly found in the wall thickness and tube supports. This provides details and this recommended walkdowns to verify that the installations are correct.

Westinghouse Operation and Maintenance Memo 120, August 13, 1990

First recommended continuous operation of the purification system. Plus, this recommended a maximum pressure of 30 psi for the fuller's earth and 25 psi for the cellulose filter and that servicing of the servo-valves is only by Moog.

Westinghouse Care, Handling and Applications of Control System Fluid, I.L. 1250-6375-A, August 1993

Listed FMC Durad (now Chemtura Reolube Turbofluid 46B) as an approved fluid, recommended continuous purification and only mentioned Selexsorb but not fuller's earth for purification.

Westinghouse Operation and Maintenance Memo 120, Rev 1, December 15, 1997.

Re-stated the need for continuous fullers earth purification, lowered the maximum pressure drop across the fuller's earth from 30 to 15 psi, lowered the maximum acid number from 0.25 to 0.20 mg KOH/g and changed servicing of the servo-valves from Moog to a "Westinghouse designated service center".

Customer Advisory Letter (CAL) 96-01 EH CONTAMINANT RELIEF VALVES

Lowered the maximum pressure drop across the "cellulose" filter housing from 25 to 15 psi and suggested inspecting the housing internal seals for damage.

Our comment: In addition to the above it is also suggested that on start-ups that the purification housings not be valved in until the fluid reaches the "normal" minimum operating temperature of 120℉. This is especiall y true after a new purification media cartridge has been installed. The rational is that the pressure drops can be much higher with colder fluid that can cause the internal bypass in the housing to open temporarily. This could dump fines directly into the reservoir. In addition, some installations can benefit from the installation of air release valves for the filter housings, flow gauges for the fluid purification, and upgraded filter elements.

kjb 2/10 2/09