

'Providing Tribological Solutions'

FOREWARNING

As an added service a FORewarning is provided when a test parameter is either tending to go out of specification or is out of specification. This is so that effective corrective action can be taken as soon as possible.

Because of the many differences between designs and consumables, these have to be generic. However, specific suggestions for any system can be provided on request. Just call, fax or e-mail your inquiries. Technical Notes are also available for many fluid topics.

VISCOSITY

Background: Approved phosphate ester fluids for steam turbine control systems are considered to be an ISO VG (viscosity grade) 46. However, turbine OEM limits (i.e. 38.4 to 44.2 cSt) are based on an older SUS system and from before the ISO limits (i.e. 41.4 to 50.6 cSt) were established so that the limits do not match. The in-service viscosity should be around 40 cSt at 40°C and not change significantly (>5%) from test to test unless there is a reason.

Reason for Prompt Action: A change in viscosity can mean that the sample was taken from the wrong system so that all the other data is not applicable or it can mean contamination and/or severe fluid degradation. This should be corrected as soon as possible to minimize consequential damage. The steam turbine oil is often an ISO 32 grade so this is added by mistake the viscosity will decrease accordingly.

Cause: A slight change in viscosity is most likely that make-up fluid is not the same. This is normal and is one more reason for testing new fluid and trending. The more fluid added the greater the change. Other reasons for a change in viscosity can be the addition of mineral oil or waste fluid. This is more damaging, see Mineral Oil FORewarning. This would only be detected by viscosity if that of the mineral oil was different. Contamination with excessive water can cause a change so this should also be checked because over a long period of time hydrolysis will tend to show a gradual decrease in viscosity.

Action: Determine the viscosity of the fluid being added as make-up and also quarantine any suspect drums until the results are back. This is in case the drum had been contaminated. Only drums containing new fluid and specially marked waste drums should be near the units. Check also the specific gravity (~1.12), mineral oil content, water content and TAN of the fluid in the drum and in the unit. A fluid change is likely required if mineral oil or waste fluid was used.