



Hydraulic & Lube Oil Contamination Challenges (Combustion & Steam Turbines)

Presented by:

Richard Trent, Manager-Technical Field Services-Southern, USA, HY-Pro Filtration.
Scott Howard, Manager-Technical Field Services-Eastern, USA, HY-Pro Filtration.

Learning Objective:

The student will become familiar with why hydraulic and lube oil system reliability can be significantly affected by keeping fluids clean and dry with proper contamination solutions and proactive strategies. The student will learn about different types of contamination, how they are quantified and the impact that they have on the system. This course will impart information to the student familiarizing him with such concepts as types of contamination and phenomenon commonly found to be detrimental to hydraulic and lube oil systems. The student will be presented with an overview of the specific types of contamination and phenomenon such as particulate, water & varnish, acid and dissolved metals in EHC systems, sub-micron carbon particles and element spark discharge.

In addition the student will learn about the methods of interpreting the details of oil analysis reports, and the criticality of identifying opportunities for improvement and tracking the results of improvements implemented.

Topics Covered:

1. ISO Fluid Cleanliness Codes – quantifying particulate contamination
 - a. ISO Code Introduction (ISO4406:1999)
 - b. Establishing target ISO cleanliness codes
 - c. Proper oil sampling techniques
 - d. Oil sampling results interpretation
 - e. Strategies to improve fluid cleanliness

2. Lube Oil Varnish – Unit trip & Peaker Fail to Start Conditions
 - a. What is varnish
 - b. Causes and consequences
 - c. Interpreting oil analysis reports
 - d. Removal and varnish prevention
 - i. SVR
 - ii. NSD
 - e. Extending useful oil life by protecting anti-oxidant additive package

3. Water In Lube Oil
 - a. Types (Dissolved, Free, Emulsified)
 - b. Sources
 - c. Interpreting oil analysis reports (ppm vs %)
 - d. Strategies for water removal
 - i. Vacuum dehydration
 - ii. Oil / Water separation by coalesce
 - iii. Reservoir headspace drying

4. Phosphate Ester Conditioning – Maintaining Phos-E fire resistant fluids
 - a. Challenges associated with Phos-E fluids
 - b. Condition monitoring (acid, water, particles, dissolved metals, patch weight)
 - c. Interpreting oil analysis reports
 - d. Sources of contamination
 - e. Strategies for maintaining Phos-E in proper condition
 - i. Water removal & prevention
 - ii. Acid & dissolved metal removal
 - iii. Particulate contamination control
 - iv. Removal of sub-micron particles



Richard Trent has been a Manager, Technical Field Services in Southern USA with Hy-Pro Filtration since August 2004. He has 25 plus years of experience in design and service of hydraulic systems and components. Richard has received certifications for hydraulic specialist from (International Fluid Power Society) and Certified Lubrication Specialist (CLS) from Society of Tribologists and Lubrication Engineers. Richard lives in Birmingham, AL with his wife and enjoys riding his motorcycle and fishing. Richard's email address is richard.trent@hyprofiltration.com.



Scott Howard has been a Manager, Technical Field Services with HY-Pro Filtration in Eastern USA since July 2002. He specializes in training his distributors, OEMs and end users with 20 plus years of experience in hydraulics, fluid power and special focus the last 15 years on fluid conditioning. Active STLE certifications include Certified Lubrication Specialist (CLS) and Oil Monitoring Analyst (OMA). Prior to fluid power he was a US Navy classroom instructor at NNPT Ballston Spa. Classes focused on Naval Nuclear Power and associated systems on submarines and surface ships. Scott lives in Virginia Beach, VA with his wife. Hobbies include NASCAR, fishing and bird watching. Catch Scott at scott.howard@hyprofiltration.com