ANALYSTS, INC.

The First Fluid Assessment Program

The proper functioning of a turbine is critically dependent on the performance of the turbine oil in use. If the lubricant does not provide the required performance, turbine owners risk unscheduled down time, damage to equipment and the potential for significant unexpected costs. All turbine manufacturers carefully specify the characteristics of the lubricants suitable for their turbines, defined by requirements detailed in a broad set of performance and laboratory bench tests.

Turbines in power generation generally rely on reservoirs with capacities that can exceed 10,000 gallons, containing oil that can remain in the lubrication system for up to 20 years. Consequently, monitoring the condition of turbine oils is critical for a number of reasons.

- Expense of repair and lost production when an undetected, wear-related condition leads to failure.
- Damage caused to the equipment as a result of oil deterioration in service.
- Expense of unnecessarily replacing multi-thousand gallons of oil and disposing of the changed oil.
- Lead time required to plan, prepare for, and change oil.

VITALPOINT℠
ADVANCED FLUID ASSESSMENT

To meet the needs of today's turbine operators, Analysts, Inc., developed the VitalPoint℠ program. VitalPoint℠ is specifically designed for the Power Generation industry, to go beyond the "standard" tests currently available in the market. VitalPoint℠ provides the most comprehensive set of test packages and includes industry standard, ASTM and Analysts' proprietary-test methods. VitalPoint℠ provides the information needed to ensure proper functioning of turbine systems.

Five Levels of Assurance

- **QSA℠ Series**
  Testing packages designed to assess the varnish potential of turbine oil and other vital oil quality parameters.
- **TOM℠ (Turbine Oil Monitoring)**
  Modeled from test recommendations in the ASTM D4378, for monthly to quarterly lubricant sampling intervals.
- **TOQ℠ (Turbine Oil Quality)**
  Modeled from the test recommendations in ASTM D4378 for semi-annual to annual lubricant-sampling intervals.
- **TLA℠ (Turbine Lubricant Assessment)**
  The most comprehensive test package available for turbine oils. TLA℠ covers the majority of the testing outlined in the TOQ, as well as a determination of varnish potential, additive levels and degradation mechanisms. Each report includes customized, detailed interpretation and recommended actions.
- **CFA℠ (Control Fluid Assessment)**
  The CFA is the most comprehensive test package available for control fluids (phosphate ester lubricants). The CFA package is based on testing recommended by ASTM, major OEM's and Analysts' years of experience and is designed to optimize fluid life and avoid costly fluid replacement and down time. Each CFA includes customized, detailed interpretations and recommended actions.

VITALPOINT℠ — ADVANCED FLUID ASSESSMENT

Oxidation Analyses

The RPVOT (ASTM D2272) laboratory analysis measures the oxidation stability of turbine oils. In this procedure, the oil is exposed to oxidation catalysts including water, copper, high temperature, agitation and oxygen in a sealed, pressurized vessel. During the analysis, the pressure of the sample is monitored. When the oil's oxidation inhibitors fail, the oil will absorb the oxygen, resulting in a pressure drop. The result is known as the RPVOT Remaining Life, and it is expressed in minutes. Depending on the type of oil, ASTM D2272 takes a few hours to a few days to complete. The RPVOT Remaining Life, when related to the RPVOT Life of the oil when it was new, indicates the characteristics of the oil's current oxidation stability.

Stability Test Options

While RPVOT is the standard oxidation stability test featured in Analysts' turbine-oil programs, two others are offered:

The Mitsubishi Heavy Industry (MHI) Dry-TOST and the Remaining Useful Life Evaluation Routine (RULER™).

- **MHI DRY-TOST** is a test method used to evaluate the tendency of inhibited gas and steam turbine lubricants to form sludge during oxidation in the presence of oxygen and copper and iron metals at an elevated temperature. The test method can be used for testing circulating oils having a specific gravity less than that of water and containing rust and oxidation inhibitors. Varnish-deposit related issues in gas-turbine oils is one of the most important lubricant end-user issues.

- **RULER™** is another technology to determine antioxidant levels. In this procedure, the antioxidants are measured by electrically charging a prepared sample and measuring chemical changes within it. The technique uses a solvent to chemically activate the oxidation inhibitor additives in the sample. Test results are presented in RULER™ numbers which are used to track antioxidant depletion rates.

  This test is used primarily for trend analysis and requires reference information on the oil before testing. The type of antioxidant additive blended in the oil must be known; the additive package cannot be changed; and the solvent must be precisely matched to the type of antioxidant in the oil.

Call Today

Call toll free to the lab nearest you to speak with an Analysts representative and learn more about how our turbine-oil analysis programs will assist your operations and maintenance.
Or visit us at www.analystsinc.com.

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