FAILURE ANALYSIS: Improved Reliability & Service Life for Complex Engineered Systems

RJ Lee Group extends your manufacturing and maintenance capabilities by resolving your failure analysis challenges. Augment your team with the right expertise to:

- Recognize warning signs for impending failure
- Assess failure conditions
- Prescribe the correct investigative path (analysis methods, instrumentation, scientific expertise)
- Predict component failures
- Recommend or qualify replacement materials

CASE STUDY: Missile Slip Ring Life Extended by Factor of Nearly 7

In this study, slip rings from missile slip-ring assemblies were life-tested on custom-designed fixtures to assess deterioration and to predict service life. As part of the study, fill fluids in the slip rings were filtered periodically and analyzed by computer-controlled scanning electron microscopy (CCSEM) techniques to characterize the size, morphology and composition of wear debris and other contaminants. Once the slip rings had undergone extensive testing and the fill fluids were analyzed, the resulting data were used to determine which component was exhibiting wear and what form it took. Eventually, the rate of deterioration and projected life cycle for the affected component were able to be predicted based on the analytical results.

The ability to identify the failing component and to project the time of service life led to a better choice of design components as well as to needed modifications to the material. An additional benefit was that it also resulted in assessment of the relative quality of various fill fluids. By carrying out design and materials modifications prescribed by the data results, the life of the slip ring assembly (a critical component) was extended a factor of nearly seven.

Assess machinery health, reduce maintenance cost and extend component life

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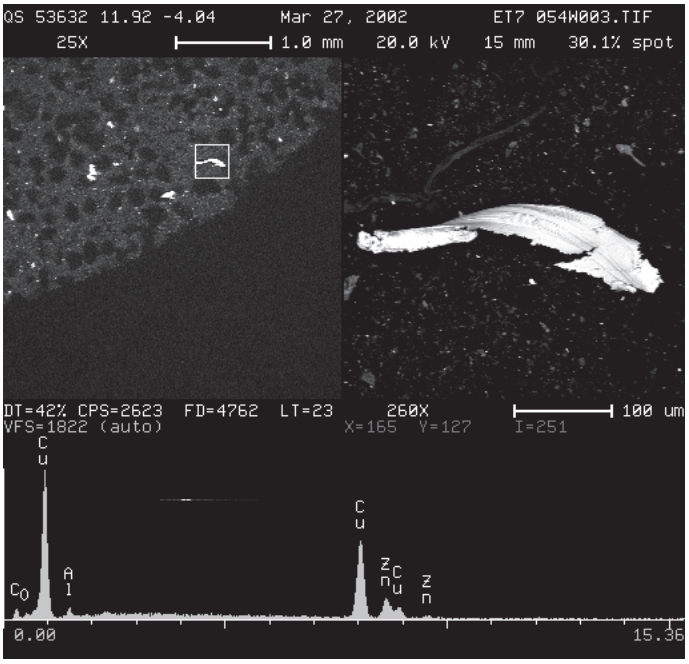
Fluid & Wear Debris Monitoring

Your maintenance and fleet management team depends on the monitoring of wear debris and lubricating fluid analyses to minimize failures. RJ Lee Group specializes in the analysis of the debris that becomes entrained in engine oils and other lubricants. RJ Lee Group works with systems and engine maintainers to efficiently produce reliable system or component life projections based upon accurate data for amount, size, composition, and morphology of individual wear debris particles. As part of an ongoing monitoring program, routine analysis can help you;

- Prevent failures
- Minimize downtime
- Determine a projected service life



Proper characterization and monitoring of wear debris can provide a prognosis of a components service life.

Standard Analysis Methods

Spectrographic Oil Analysis- Atomic Absorption (AA), Atomic Emission (AE)

Used as a tool to establish an engine's wear trend and identify deviations from the established norm. It identifies the presence of submicroscopic material that is suspended in the oil in parts per million (PPM).

Computer-Controlled Scanning Electron Microscopy (CCSEM)

Used to analyze debris and configured to look for specific wear debris particles that have been linked to failures for particular engines.

Bulk X-Ray Fluorescence (XRF)

Reliable method for the analysis of elemental composition that includes simple sample preparation and rapid analysis at minor and trace levels.

MIDAS Software Applications for Improved System Reliability

RJ Lee Group's MIDAS decision-support tools help your team make intelligent decisions. Based on Reliability Centered maintenance (RCM) methodologies, MIDAS applies consequence-evaluation and policy-selection algorithms the enhance Preventative maintenance(PM) planning to;

- Improve overall system health and reliability
- Reduce maintained costs and unscheduled repairs
- Model long-term effect of engine conditions

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