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LOCKHEED MARTIN AND SPECTRO JOIN FORCES TO MARKET LASERNET FINES MACHINERY WEAR ANALYSIS BREAKTHROUGH

AKRON, Ohio, March 15, 2000--Lockheed Martin Naval Electronics & Surveillance Systems-Akron and Spectro Inc. have teamed to bring to market a new wear particle fluid analyzer that monitors wear condition of large machines to avoid costly—sometimes catastrophic—unscheduled downtime.

LaserNet Fines technology combines laser imaging and artificial intelligence to characterize wear debris in batch oil samples. Its laser-imaging device identifies objects greater than 5 microns and identifies by wear type objects greater than 20 microns. A neural-net classifier uses object shape and size features to sort small particles (fines) into various categories such as cutting wear, fatigue wear, sliding wear, and oxides. Particles are then sorted into several bins, including NAS categories of 5-15 microns, 15-25 microns, 25-50 microns, and greater than 50 microns.

Built in a configuration similar to a small desktop personal computer, engineers at Lockheed Martin incorporated a touch-panel graphical user interface on the top of the unit for quick viewing by operators. Operators view a series of information-packed menus and graphs to assess current condition against past results.

LaserNet Fines processes and stores thousands of images to obtain good counting statistics. Each laser pulse provides a single image frame to be analyzed and the results of thousands of frames are combined to develop a complete record of the machine under study. Its database stores results from each test, allowing long-term trend analysis by particle size and type for any machine.

Direct imaging of particles by LaserNet Fines eliminates any need for calibration with a dust test. It also ignores air bubbles and “sees” through heavily sooted oils. A powerful laser transmits a light pulse through a thin cell in which slowly flowing samples are sandwiched between two glass plates. Using magnifying optics, an image of the sample is captured by a charge-coupled device video camera and stored in computer memory. Each image is processed with a raster scan analysis to identify objects.

Naval Research Laboratory, with support from the Office of Naval Research, initially developed LaserNet Fines technology. Lockheed Martin Naval Electronics & Surveillance Systems-Akron productized the design and holds a license for commercial use. The Navy has several pilot units at land-based and shipboard test sites around the world.

Spectro Industrial Tribology Systems Inc., Littleton, Mass., is an instrumentation company that specializes in analytical instruments for machine condition monitoring based on oil and fuel analysis. Products include the SPECTROIL line of emission spectrometers, particle analysis instruments and complete turnkey systems for oil or fuel analysis laboratories that include all require instruments, software, installation, training and applications support.

Lockheed Martin Naval Electronics & Surveillance Systems-Akron, Ohio, has developed leading edge aircraft self-protection countermeasures based upon laser technology. The business unit is a premier supplier of tactical aircraft simulation and training devices, guidance and imaging sensor systems, lighter-than-air surveillance systems, and antisubmarine weapons systems. Headquartered in Bethesda, Md., Lockheed Martin is a global enterprise principally engaged in the research, design, development, manufacture and integration of advanced-technology systems, products and services. The Corporation's core businesses are systems integration, space, aeronautics, and technology services.

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