

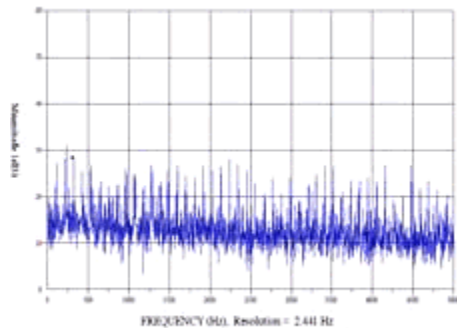
Achieving Test Cell Objectives

Quantifiably measured defects

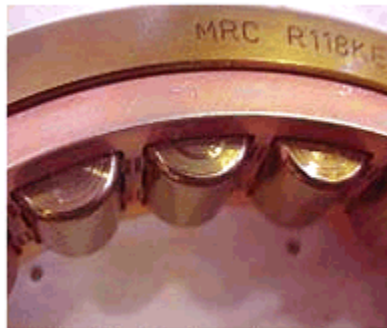
The objective of the engineering and test stand is to ensure performance, reliability, and quality of the final product prior to being rolled into production. The SWANview™ System provides superior accuracy in evaluating products under the complex operating conditions introduced in this environment. Using SWANview, you're able to monitor adverse loading, imbalance, oil degradation and the effects of these and other conditions on the health of machinery. SWANview is able to quantifiably measure defects and quickly isolate fault location. Having this information during the development process reduces the concept-to-operation life cycle and makes the most of stringent test procedures.

The SWANview System was recently used in the development test cell of a leading gas turbine manufacturer. The test put Stress Wave Analysis (SWAN™) head-to-head against vibration technology in seeded fault testing for their next generation engine. During the initial test, SWANview identified a problem that was not planned as part of the seeded fault and was not detected by vibration sensors. During the second scheduled test, the vibration technician was looking for signs of a problem in the vicinity of the anomaly that was picked-up by the SWAN system but found no evidence of damage. The SWANview System detected the same anomaly during the second test and was able to correlate the damage to a specific bearing indicating that it looked like "roller end wear or evidence of the rollers rubbing on the cage shoulder". To the surprise of the manufacturer, tear down and inspection confirmed the presence of the damage as predicted.

Spectral Analysis:



Sensor 102: 106 Hz. Spectral lines



#2 Bearing showing roller end wear

The diagram on the left shows SWANview's Spectral Analysis data for the test described above. Spectral lines 10db above background levels are indicative of a repetitive shock. The repetitive spectra event shown is at multiples of 105.8 Hz; the cage defect frequency. The photo on the right clearly shows roller end wear and abrasive wear on the race shoulder as predicted. SWANview commonly detects machine wear and damage that is not severe enough to be detected or identified by vibration technology.

Time is money - SWANview saves you time

Stress Wave Analysis provides valuable information when used in the product Engineering Test Stand environment. SWANview is being used today to detect possible design defects during the development process and to measure and track the effect of damaged components on equipment operation. Identification and correction of product problems in the development phase is more cost effective than fixing a problem in the field.

The use of SWANview in the Maintenance Test Cell environment provides the information you need to do your job smarter and faster. Knowing the type and location of damage prior to tear down, inspection and overhaul gives you the competitive edge by enabling you to provide quicker repair turnaround without affecting your service quality standards.

Cutting edge technology that gives you a competitive edge

The analysis software tools provided by SWANview enable you to collect and analyze data with minimal training. The Stress Wave Analysis data is displayed as an easy to interpret graphical representation of the health of the machine. The information is provided realtime and enables even a novice technician to make a determination as to the health of a machine in a matter of minutes.

When a defect is identified, SWANview provides detailed information that can be used to determine the damaged component and its location eliminating the need for time consuming detailed inspection on a component-by-component basis. The system will locate the problem so you can focus your energies on repair and replacement of parts instead of the tedious task of fault isolation.

Flexibility that keeps you flexible

SWANview is available as a portable or desktop system and is able to detect a wide range of machine problems including:

- Localized surface damage
- Shaft misalignment / imbalance
- Lubrication effectiveness
- Seal damage

The flexibility of the SWANview System enables the product to operate in a variety of environments with repeatable setup from machine to machine without the need for unique baselines or re-calibration. SWAN technology has been proven to work on a variety of machine operations including:

- Gas Turbines
- Transmissions
- Electric Motors
- Gearboxes
- Pumps
- Propulsion Systems

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