

Briefing: Swantech's New Generation of Ultrasonic Diagnostic Systems

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Since its inception in the 90's, Plant Asset Management (PAM) has grown in functionality to meet customer needs accelerated by advances in monitoring technologies. PAM solutions assess the health of plant assets (machinery, production and automation equipment) by monitoring its condition to identify problems that affect production processes and potential catastrophic failures. PAM enables predictive maintenance strategies and when combined with information from control and business systems, provides invaluable insight necessary to operate and maintain today's increasingly complex production plants.

In a recent update, **Swantech**, Fort Lauderdale, Florida, a manufacturer of ultrasonic diagnostic systems, briefed ARC on their new ultrasonic PAM monitoring solution using their patented Stress Wave ANalysis (SWAN) to determine the operating health of plant machinery assets. Ultrasonic technology is not new, but recent innovations have made it one of the more promising measurement technologies for demanding applications. Unlike vibration sensor technology, typically deployed for condition monitoring that operates in lower frequencies, SWAN sensors operate in the ultrasonic range well beyond the high-frequency audible hearing limit of humans. According to Swantech, working in the ultrasonic range provides inherent insensitivity to low frequency plant and equipment vibrations that can affect typical vibration sensors making them difficult to implement, requiring multiple sensors installed in dedicated locations and orientations. Non-intrusive SWAN ultrasonic sensors do not have these restrictions, and only one ultrasonic sensor is typically required for an application mounted without location and orientation considerations. This makes installation quick and easy by the general maintenance or the instrumentation technician.

Compared to vibration technology, the SWAN ultrasonic solution can provide significantly earlier and quantifiable detection of defects allowing operators a greater opportunity to take appropriate action to extend the life of the asset. The SWAN solution is sensitive enough to determine the slightest change in machine dynamics long before significant defects in bearings, gears and other components due to stress or lubrication degradation while reducing false alarms. In addition to continuous monitoring of operating equipment, SWAN could also be used to validate the quality of repairs or validate the health of newly installed equipment. Studies have shown that preventative maintenance can, in many cases, leave a machine in a worst state than prior to the maintenance.

The SWAN Stress-wave (SWE) analysis detects and measures slight shock and friction that occur between contact surfaces in rotating machinery. It measures friction energy as component parts rub and slide against each other and can detect defects and directly quantify the level of wear well before the tripping of a vibration sensor. SWE can identify defects such as surface cracks and pitting, out of balance, shaft and coupling misalignment, insufficient lubrication and other mechanical problems. According to Swantech, SWE is the only technology capable of providing early enough advanced warning needed to enable actions that will prevent serious equipment damage.

Swantech's experience in the marine, wind power, and oil & gas solutions is providing an excellent foundation for expansion into the process industries. Their major OEM partnerships include machinery manufacturers **Dresser Rand** and **Solar Turbines** (Caterpillar). Swantech solutions have been successfully applied to gas turbines, pumps, compressors, gearboxes, electric propulsion, paper machines, rolling mills, and other heavy machinery.

Swantech provides a portfolio of solutions designed for specific applications from an entry level solution, SWANguard, configured as a "friction transmitter", to SWANview LX, a highly scalable, standards-based networked system offering remote monitoring and diagnostics across a local area network (LAN), wide area network (WAN), or the Internet. It enables operators or equipment manufacturers to assess the condition of machinery and isolate faults in large, remotely located, or unmanned facilities.

Swantech has challenges typical of smaller companies. This includes selecting opportunities appropriate for their resources, increasing brand awareness, product differentiation, and customer education. Swantech distributes their products through a dedicated sales channel and is actively pursuing partnerships with suppliers in the process and manufacturing industries.