



Welcome to the first edition of the quarterly Sensonics newsletter, where we aim to keep our customers and partners up to date with new developments, as well as providing details on case studies and measurement techniques for the protection of critical rotating plant.

Vibration protection to IEC61508

One of the challenges facing large fan and centrifuge equipment operators is to ensure appropriate safe use over the operational life of the plant. Catastrophic failure of this type of asset is not only expensive in terms of repair cost and lost revenue through downtime, but also poses a significant health and safety risk. The monitoring of vibration can play a key role in meeting these challenges.

What level of integrity does a vibration protection system need to ensure safe shutdown under all operational conditions? What maintenance regime do we implement to maximise the overall system integrity? These are common questions asked when considering such protection systems and the IEC61508

international standard for functional safety can be applied to ensure sufficient integrity is designed in to the electrical/electronic systems employed for this function.

The methodology starts with targeting the appropriate 'Safety Integrity Level' or SIL required for the process, banded from 1 to 4, with 4 being the most severe. With the target established and a proposed protection system in place, a failure mode and effects analysis is carried out on the overall control loop, from sensor to shutdown actuator. This determines not only the MTBF of the equipment but also the diagnostic coverage and the safe failure fraction. These factors in combination with protection system redundancy are used to calculate the overall SIL level.



E-Series centrifuge (courtesy of Thomas Broadbent & Sons)

Sensonics has, for a number of years, provided smart vibration protection systems for many industrial sectors, with a particular focus on the centrifuge equipment market.

For example, the DN2611 is a dual channel monitor, ideal for machine casing and bearing vibration monitoring. It offers dual level alarms (warning and danger) for each channel and provides a relay interface for alarms and vibration transducer integrity.

Two levels of alarm permit one alarm to be used as an interlock during start up, to prevent run-up in the presence of excessive vibration, while the other can be utilised for shutdown in the event operational failure.

Current loop outputs for each channel are provided for interfacing with a PLC for trending and further alarm monitoring. The transducer interface can be configured for operation with or without safety barriers.

In a simplex configuration with no redundancy the accelerometer and monitor are suitable for SIL 1 applications. In a duplex configuration, protection can be provided at SIL 2 levels. While the probability of failure to trip on demand for each configuration meets the 61508 requirements, the spurious trip performance is also excellent, offering a high integrity protection solution with minimal downtime due to spurious events.



DN2611 vibration monitor with EEx ia IIC PZS4 accelerometers

Recent contract award highlights

- Awarded 3-year turnkey supervisory equipment (thrust, vibration and speed) upgrade contract for steam driven and electric boiler feed pumps - nine systems in total. *Location: UK*
- Awarded 4-year turbine supervisory equipment calibration and maintenance contract. *Location: UK.*
- Four complete turbine supervisory systems including vibration, speed and rotor/stator Air Gap. *Location: Romania.*
- Supply of Turbine supervisory system (third of four planned). *Location: Hungary.*

Training for our Chinese customers

During March this year, Sensonics was pleased to welcome a delegation from the Nuclear Power Qinshan JV Company for a four-day training event at our offices. They utilise a range of Sensonics 'Aegis' equipment on their Weir manufactured pumps for monitoring thrust, speed and reverse rotation.

For the training we simulated their complete monitoring system on our in-house spin rig, in conjunction with the Aegis monitoring equipment. This enabled us to provide a full practical demonstration of the features under various operating conditions specified by the customer.



I&C Engineers from the Nuclear Power Qinshan JV Company

Extended temperature range Proximity Probes

During April, Sensonics added a new version to its popular Senturion range of eddy current proximity probes, with the capability of operating to 240°C. The non-contact probe offers a 5mm measurement range in a 12mm tip diameter configuration and is available in a range of body and cable lengths.

Above 150°C, standard probes begin to exhibit excessive measurement drift and typically utilise materials only suitable for occasional operation at 200°C. In some steam and gas turbine applications temperatures can rise above 200°C in the probe locality for significant periods. Maintaining a measurement error of less than 5% over the full working temperature range is key for these types of scenarios.

This is particularly important for differential expansion measurements where an invalid reading due to a small steam leak close to the probe can lead to operational downtime.



Sensonics are a leading supplier of turbine supervisory and high integrity protection equipment to industry. With 30 years experience in providing vibration, displacement and speed instrumentation solutions in demanding environments, not only do they supply a full range of sensors and API 670 compliant measuring and protection equipment, but also offer design through to installation and commissioning services.

A busy time at the NEC - Maintec 2007

We recorded an increase in visitor numbers at Maintec 2007. Numbers were estimated to be double that of last year's event. Order promises and quality of leads were also up on 2006 as were requests for a follow-up meeting from prospects visiting the stand.

We put the increased interest down to the spate of new product launches. The company's new compact cost-conscious SpyderNet 8-channel vibration and process monitor with remote monitoring attracted particular attention.



Sensonics Stand at Maintec 2007 NEC

New Vibration Transducer catalogue

Following the success of the Turbine Supervisory Guide released last year, we now have a new Vibration Transducer Catalogue - hot off the press.

Containing full device specification details as well as useful application advice, it continues our trend of providing quality product information.

