



Welcome to our latest newsletter, keeping our customers and partners up-to-date with the latest developments at Sensonics. New projects, new products and case-studies, all helping to protect your critical rotating plant.

CRITICAL PROTECTION SYSTEMS DELIVERED TO NUCLEAR POWER PLANT IN UAE



SENSONICS have delivered the first tranche of machinery protection systems to the Barakah Nuclear Power Plant project in the UAE. Following a two year design and production phase, the equipment delivery, made up of 92 (ninety two) Sentry G3 4-channel protection modules and over 300 channels of vibration analysis across three cabinets, is currently undergoing commissioning as part of the Unit 1 construction phase.

The instrumentation will monitor and protect 45 machines, the balance of plant equipment for Unit 1, consisting of various fans, pumps and motors in support of the steam turbine. The fully programmable Sentry G3 equipment is utilised to monitor bearing and shaft vibration in addition to thrust wear and speed.



The specification includes dual redundant power supplies in each rack with redundant

Ethernet communications to the main plant systems for trending of overall vibration levels and the reporting of alarms. A condition monitoring package is also integrated with the G3 equipment to provide real time analysis of the vibration signals. All data is stored on a local server which provides live machine Mimic's in combination with offline analysis of historical trends

This major overseas contract for the **Korean Electric Power Corporation** is another example of Sensonics' commitment to developing the most innovative and robust solutions for vibration, position and speed instrumentation for critical machine condition monitoring applications in power generation, petrochemical, paper production and process manufacturing industries around the world.

PROX PROBE SYSTEM WITH UNIVERSAL DRIVER

Sensonics have introduced a new range of proximity sensors suitable for measuring shaft vibration, position and speed on rotating plant. Building on their established Senturion proximity probe range, the new **SENTURION X** series offers a configurable universal driver suitable for all probe cable combinations and offers new features including a separate socket for gap voltage monitoring.

Proximity probe systems are made up of a calibrated probe, extension cable and driver. Utilising the eddy current principle, this combination forms a tuned circuit with the target material and variations in probe face to target distance are detected in this circuit by the driver. This provides a linearised voltage output proportional to target gap with a nominal sensitivity of 7.87mV/um. This type of measurement system provides highly accurate (resolution typically less than one micro-meter) vibration and relative positional measurements, for harsh environments up to 180°C.

The **Senturion X** probe range offers several improvements including:-

- **Switch selectable system cable lengths 5m, 7m and 9m.**
- **LED indication of selected length.**
- **3.5mm socket for gap voltage monitoring.**
- **Double screened cable for high noise immunity.**
- **Snap lock and shake proof cable connection.**
- **Low profile driver for easy local integration to machine (Din rail mount option).**
- **Excellent repeatability on replacement of either probe, extension or driver.**

continued on page 2

continued from page 1

The driver unit offers selectable system lengths of 5m, 7m or 9m, with a front panel green LED indicating the selected option. This provides flexibility on-site when installing the system, where in most cases different system lengths are required on the various machine locations, with the additional benefit of minimising the spares holding.

The gap voltage monitoring socket assists with commissioning the probe system; a volt meter can be connected directly to the driver through the 3.5mm standard audio socket to display the gap voltage at the point of installation and the probe mechanical gap can then be adjusted to suite the application.



The cable system incorporates snap lock connectors which require no torqueing and provide a shake proof solution important for heavy industrial applications. The double screened cable offers robustness in combination with high immunity to interference and optional stainless steel convoluted armour is available for applications or environments where cable protection is paramount.

The universal driver concept follows on from other universal hardware platforms developed by Sensonics which offer a single hardware platform for all the necessary turbine and pump vibration and supervisory measurements. Reducing spares holding and field upgradability is a key advantage of adopting this latest generation of equipment.

OVERSPEED PROTECTION FOR TURBINES AND PUMPS

Overspeed protection is vital in the power generation industry. Failure of the turbine or pump speed governing system can lead to rotor damage with expensive consequences. Independent speed monitoring and protection minimises these risks as far as practicable and Sensonics offer high integrity overspeed protection systems with proven field reliability. These systems are being continually developed and enhanced to meet customer's needs in both the conventional and nuclear power industries. The result is a highly reliable hardware configuration with online test facilities.



Our four channel Sentry G3 module has been specifically designed with an independent digital signal processor (DSP) for each channel of measurement for ease of scalability in combination with high integrity. The DSP can be software loaded with the specific measurement algorithm which controls the sensor selection and also the protection relay status and analogue output levels. This provides complete hardware autonomy from sensor through to the protection relay combined with a high channel density (24 channels in a 3U format).

It is typical for overspeed protection to utilise a two out of three (2/3) voted channel arrangement to comply with stringent spurious trip requirements. This is implemented in G3 by

utilising 3 modules, each with a single DSP channel to maintain channel hardware segregation, and configured with the overspeed algorithm. G3 offers the advantage that the remaining module channels can be utilised for other machine measurements such as bearing vibration, shaft position or temperature. Alternatively the DSP cards can be removed for a more cost effective solution.

The rack based system operates on a dual +24Vdc power supply backplane, either connected externally, or derived from the optional G3 dual redundant rack based power supplies. A voting module incorporating various test facilities in the rack performs the 2 out of 3 voting function.

For high integrity protection, the IEC61508 international standard for functional safety can be applied to ensure that sufficient integrity is designed into the electrical / electronic systems employed for the safety function. The Sentry G3 OSP achieves a SIL 3 rating in this respect

Features of Sensonics OSP

- Voted arrangements - 2 of 3 and dual 2 of 3 as standard.
- On line test trip and signal injection.
- Key lock inhibit.
- High visibility displays and lamps.
- Approval to IEC 61508.
- Dual redundant or module independent power supply option.
- Response time <20ms.

POWERGEN EUROPE SUCCESS

SENSONICS exhibited at Powergen Europe in Amsterdam in June and there was strong interest from the machine builders and end-users in the G3 range of equipment. Russell King, Managing Director at Sensonics commented.

"It was the first time we had demonstrated our new proximity probe system with the universal driver and potential customers seemed very interested in this new concept to market. The show was well



attended with visitors from all over Europe and we are looking forward to following up the opportunities and turning them in to real projects."

SEE US AT ADVANCED MANUFACTURING 2015

See us at the Advanced Engineering Show 2015 at the NEC Birmingham, billed as the UK's largest advanced engineering trade show and conference. The show takes place on 4th and 5th November where we are exhibiting in conjunction with **HGL Dynamics Ltd. & Sensors on Stand H65.**

For more details about Sensonics go to: www.sensonics.co.uk

Sensonics offer over 30 years of experience as a leading supplier of turbine supervisory and high integrity protection equipment. We provide solutions for vibration, displacement and speed instrumentation applications in the most demanding environments. Our range includes sensors and API 670 compliant measuring and protection equipment, along with design, installation and commissioning services.

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