The challenge

• To design an effective hydrocarbon detection system to mitigate against catastrophic failure within the steam exchanger during well testing.

• To increase steam heat efficiency and improve temperature stability of the well effluent.

• To eliminate the requirement to run steam condensate returns overboard, thus avoiding uncontrolled discharge to the sea.

• To reduce the amount of potable water (pot water) used during well tests to fill steam boilers, and minimise the required bandwidth necessary to provide pot water during well test operations. Other uses of pot water include drinking, washing and cooking, but it is recommended to use when generating steam for well tests, as anything other than fresh water can cause significant damage to the internals of a steam boiler when heated.

• To reduce the associated emissions and carbon footprint during well testing, and to align with our customers’ carbon reduction initiatives.

“reducing emissions and carbon footprint during well testing, and aligning our customers’ carbon reduction initiatives”
The solution
• ScanTech’s patented HeaterSentry® Mk 111 consists of two components - a steam-driven condensate pump and hydrocarbon detection module.

• The hydrocarbon detection module continuously samples the steam condensate returns line for hydrocarbon contamination. The HeaterSentry® addresses this issue by detecting small amounts - less than 30ppm - of hydrocarbon oil and gas within the steam condensate returns, providing an early warning for potential failure and protecting the steam boiler from hydrocarbon contamination and possible catastrophic boiler vessel failure.

• A steam-driven power trap provides positive pumping of the steam condensate from the heat exchanger back to the steam boiler feed tank.

Results and benefits
• Attained international patent accreditation for the application, which has been selected by major international oil companies (IOCs) for well testing and production systems solutions.

• Advanced warning of heat exchanger process coil failure.

• Controlled and safe isolation of overpressure situations.

• Super-heated steam condensate pumped returns prevent heater stall and improve steam boiler efficiency.

• Built-in ability to store operational steam data of flow period that can be downloaded as a permanent record for end-of-job analysis.

• Reduces pot water usage by up to 80 percent - steam boiler pot water usage running total loss overboard typically uses 2500 litres per hour vs 80 litres when using HeaterSentry®.

• System integrates with 4-20MA well test ESD system. A 4-20MA signal is common-place within well testing which, despite the onset of reliable wireless technology, remains an option, with certain real-time data sensors requiring a hard-wired configuration.

• Zero flash steam returning to steam boiler feed tank.

• Reduces the bandwidth necessary to produce pot water offshore or by shipping large quantities of pot water to the mobile offshore drilling unit (MODU) by means of supply boat. By eliminating these factors, the required diesel usage to transport or manufacture this offshore is reduced considerably, resulting in lower carbon emissions.