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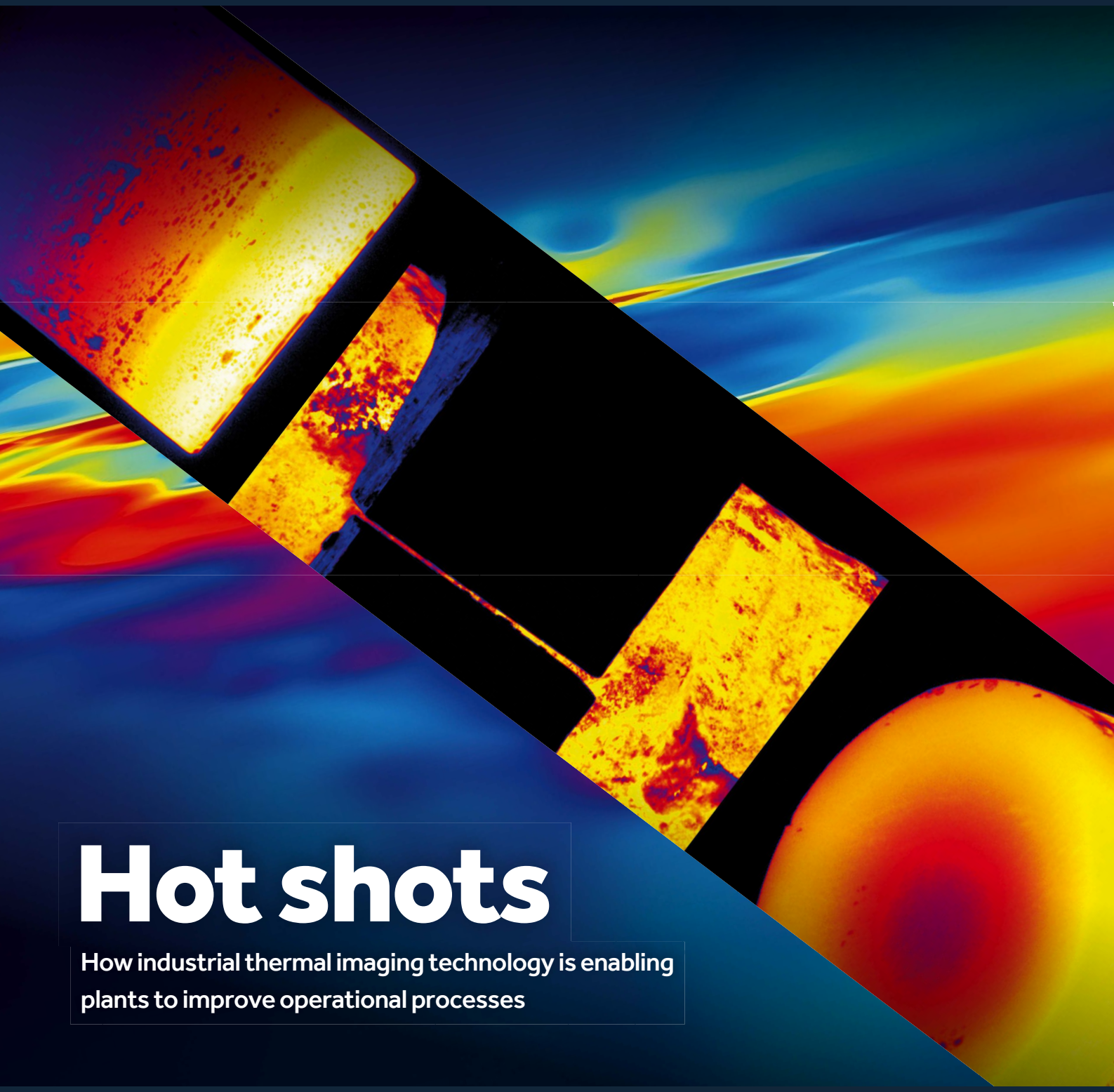
FROM THE SOCIETY OF OPERATIONS ENGINEERS



Hot shots

How industrial thermal imaging technology is enabling plants to improve operational processes

- The evolution of industrial boilers
- Reforms aim to rebuild British water supply
- Net zero cement production

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Society of Operations Engineers

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Prof Louis Lock, chair, IPlantE

International recognition

A meaningful event for Hong Kong (HK) control/automation professional engineers and Jiangsu technologists/engineers was held at the Jiangsu Association for Science and Technology (JSAST) headquarters on 19 January 2026.

A delegation of six control/automation professional engineers as per invitation was arranged to support the event. During the event in my address to delegates, I highlighted my role as vice president of the Society of Operations Engineers (SOE).

After welcoming, Wenxin Yang, JSAST Counsellor (Level II) provided an overview of JSAST and its recent activities with HK and overseas engineering organizations. He expressed the intention for professionalship of engineers in Jiangsu to be recognised internationally.

He noted that the sharing of professionalship of engineers in HK will be of good reference; mutual recognition or reciprocal recognition agreement (RRA) could be of 'critical path activities' for achieving this.

During my address I highlighted the importance of becoming a corporate member of The Hong Kong Institution of Engineers (HKIE) or the equivalent i.e. an appropriate member of the professional institution in the UK and be registered as a chartered engineer (CEng) under the Engineering Council.

I then shared my experience on the RRA between The HKIE Control, Automation and Instrumentation (CAI) discipline and the SOE. The responses appeared to be favourable. A visit to Siemens Numerical Control Ltd., Nanjing was then conducted.

The delegation then paid a visit to National Graduate College for Elite Engineers of Southeast University. Prof. Yang Chen, deputy secretary of the Party Committee cum Associate Dean of the College, welcomed the delegation.

As the head of the delegation, I then delivered a presentation entitled 'Proud to Be a CAI Engineer', where I emphasised the importance of becoming a CEng, particularly for master's/doctoral degree holders engaged in international engineering projects.

I then expressed that CEng qualification is widely recognised by major organizations, including CLP Power HK Ltd., the Government of HKSAR, etc, pointing out that CEng with one-year relevant working experience could be eligible for registered professional engineer. The feedback was encouraging.

Read more on pages 26 and 27, about why everyone seeking positions of engineering responsibility needs to become professionally registered as EngTech, IEng, or CEng

I hope you enjoy reading this issue.

URLs in *Operations Engineer* magazine

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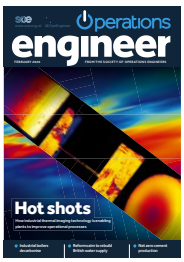

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Mission statement

Whether testing a pump, lubricating wire rope or monitoring environmental emissions, operations engineers inspect, maintain and repair equipment across a range of industries.

The mission of *Operations Engineer* magazine is to:

- Improve readers' understanding, knowledge, skills and competencies in operations engineering
- Promote the advancement of science, technology and practices in this field; and
- In so doing, promote safety, efficiency and environmental sustainability in operations engineering to benefit the wider community.

Danfoss Power Solutions acquires Hydro Holding

Danfoss Power Solutions has completed its acquisition of Italian hose fittings manufacturer Hydro Holding Spa, securing all regulatory approvals and expanding its European production footprint.

The deal adds manufacturing bases in Italy and the Czech Republic, along with 350 experienced employees, to Danfoss' operations. Hydro Holding's expertise in carbon steel and stainless steel fittings, adapters and hose assemblies will complement Danfoss' existing portfolio, enabling it to offer a broader range of fluid conveyance solutions.

Daniel Winter, president of Danfoss Power Solutions, said: "We're pleased to welcome Hydro Holding employees to Danfoss Power Solutions. This talented team will help us accelerate growth and strengthen our global leadership in fluid conveyance. Together, we will deliver unmatched hose and fittings solutions to the European market."

Hydro Holding will operate as a new business unit within Danfoss' Fluid Conveyance division under the name Hydro. Stefano Bordegnoni, former chief executive of Hydro Holding, has been appointed vice president of the unit and will report to Domenico Traverso, president of Fluid Conveyance.

Traverso said: "With Hydro Holding joining Danfoss, we complete the foundation for our new European fittings platform. Hydro Holding gives us a strong and scalable base in Italy and the Czech Republic, strengthening our ability to serve OEMs and distributors with local production, competitive cost structures and fast response times."

Bordegnoni described the integration as a significant opportunity for customers: "This is an exciting day for the Hydro Holding team and myself. Together with Danfoss, we create a strong commercial offering that enables us to deliver even greater value to our customers. Our top priority is continuity for customers and distributors, maintaining our strong focus on service, quality and innovation."

Danfoss' Fluid Conveyance division reported annual sales of €1.2 billion in 2024, manufactures hoses and fittings.

Southern Water to deploy AI-powered asset monitoring

Southern Water has entered a six-year agreement with technology firm Samotics to roll out its SAM4 smart condition monitoring system across sites in southern England.

The £7 million framework aims to reduce equipment failures and improve resilience in both wastewater and clean water networks.

The SAM4 system uses electrical signature analysis (ESA) combined with artificial intelligence to monitor equipment performance and predict faults before they occur. By identifying issues such as blockages, air locks and mechanical faults early, the technology helps prevent service disruptions and environmental incidents.

The deal follows a one-year trial in which Samotics's system detected 63 failures on submersible sewage pumps and other critical assets, avoiding an estimated £5 million in potential damage and penalties. Currently, 1,458 Southern Water assets are monitored using the technology across around 600 sites, with further expansion planned for 2026.

John Penicud, managing director for wastewater at Southern Water, said: "Unplanned failures of critical equipment can lead to a negative impact on our customers and the environment, and result in increased operational costs. Identifying issues early is critical to successful proactive maintenance."

The SAM4 system analyses current and voltage signals in real-time, with AI classifying deviations into specific fault types such as bearing wear or misalignment.

In brief

Trane has highlighted its approach to sustainable data centre cooling during Open Manufacturing Days in Charmes, France, where the company hosted industry stakeholders from across Europe. Trane welcomed more than 70 participants to its Charmes manufacturing site from 9–11 December, showcasing developments in thermal management for data centres. The event marked the launch of Trane's dedicated assembly line for data centre solutions, which almost triples existing production capacity. The investment is intended to support rising demand for resilient, energy-efficient cooling technologies across Europe, the Middle East, Africa, Australia and New Zealand, while also contributing to the local economy. Visitors toured the facility and viewed demonstrations from Trane's expanded portfolio for edge, colocation and hyperscale data centres. Technologies on show included computer room air handlers, fan wall units, high-efficiency chillers, precision cooling systems and heat-recovery equipment, all developed to improve cooling reliability, reduce power usage effectiveness and support wider decarbonisation goals. Attendees also met Trane engineering teams to discuss future requirements and examine the quality-control processes used to ensure each customised unit meets strict performance standards.

Babcock Wanson Group, a global provider of industrial boiler room equipment and energy transition solutions, has named Christophe de Maistre as its new chief executive officer. The appointment forms part of the group's growth strategy and signals a renewed focus on accelerating the shift towards electric and low-carbon technologies. De Maistre brings extensive experience in energy management and a strong track record of leading complex organisations through transformation and sustained growth. Speaking on his new role, de Maistre outlined his priorities: "Our mission is clear – to accelerate the transition to electric and low-carbon solutions and unite our teams and recent acquisitions under a single European platform."

In brief

Industrial controls specialist TIC has partnered with enclosure manufacturer **Spelsberg** to offer combined solutions for industrial control systems, supported by durable and customisable enclosures. As part of the collaboration, TIC is showcasing Spelsberg's range of industrial enclosures on its new e-commerce platform, tic-direct.com, enabling customers to select and purchase products quickly and easily. The partnership also provides complete control solutions housed in robust enclosures tailored to specific application requirements. TIC supplies industrial control and automation products, along with engineering services, to machine builders, panel and switchgear manufacturers, and system integrators across the UK. Its portfolio spans multiple sectors, including manufacturing and agritech, and includes instrumentation, power distribution, automation, control and safety products.

The Engineering Construction Industry Training Board (ECITB) has appointed new members to its Innov8 Group, a network that brings fresh perspectives on careers the in the construction industry. The Innov8 Group brings together early and mid-career professionals from across sectors to offer strategic insight into workforce development. Members meet at least four times a year and contribute to projects on labour market trends, mentoring, diversity and inclusion, and industry foresight. They also support outreach initiatives to promote engineering careers through events and STEM activities. The first generation of Innov8 members, chaired by Chinwe Odili of Kent plc, will remain involved as mentors. The New members include Finlay Duthie, graduate engineer at STATS Group; Alasdair Steven, graduate engineer at NRS Dounreay; Sarah Hague, graduate engineer at Technip FMC; Katie Bennett, graduate process engineer at Xodus Group; John MacGregor, graduate engineer at Subsea7; Natalia Bieniewska, graduate process engineer at Xodus Group; Abishan Ahilan, structural engineer at Kent and Niall Gibb, offshore commissioning supervisor at Vestas.

Orbital Marine Power secures £7m investment

Orbital Marine Power has secured £7 million in new funding to expand its commercial tidal-stream projects internationally, following the award of major tidal energy licences in Canada.

The Scotland-based company, which operates the world's most powerful tidal turbine, attracted investment from PXN Ventures – the venture capital arm of Praetura Ventures and Par Equity – alongside existing shareholders including Scottish Enterprise. Orbital's technology uses floating tidal turbines to generate predictable, renewable electricity from tidal currents.

The funding comes after Nova Scotia's 2025 procurement process granted Orbital and partner Eauclaire Tidal Ltd significant new tidal energy licences, marking a key step in the company's global growth strategy.

Andrew Scott, chief executive of Orbital Marine Power, said: "We are delighted to see Orbital Marine Power embark on its newest chapter of growth. We warmly welcome PXN Ventures as our new investor, an organisation who shares our vision and passion for Orbital's role as a clean energy leader. We're excited to advance the delivery of commercial tidal stream projects whilst driving a meaningful transition to a more sustainable future. We also greatly value the continued support and investment from Scottish Enterprise in this round, which has been instrumental in enabling this partnership to happen."

Orbital plans to double its turbine order book, having already secured UK government contracts for 14.4MW of capacity at the European Marine Energy Centre in Orkney. These six turbines will join existing O2 units, together capable of powering 18,000 homes with reliable, low-carbon energy.

The company estimates around £200 million of equipment will be built for upcoming projects, with 70% of the supply chain based in the UK. This is expected to create high-quality jobs and strengthen the country's position as a global leader in tidal energy.

Alastair Moore, investment director at PXN Ventures, said: "As electricity demand increases, Orbital has an important role to play in providing base load energy to grids at home and abroad."

Opportunities knock for apprenticeships

Holcim UK has opened applications for its 2026 apprenticeship scheme, creating new training opportunities across its construction operations for people starting out in their careers.

Holcim UK has announced a wide range of apprenticeship roles for its next annual intake, offering training across multiple disciplines and locations as part of the company's effort to attract new entrants to the construction sector.

The scheme includes both higher apprenticeships, which require A levels or 80 UCAS points, and advanced (level 3) apprenticeships, which require five GCSEs. Education partners supporting the programme include the University of Derby, EEF Make Limited and Tiro Training Ltd.

Roles will be available in specialisms such as electrical engineering, vehicle maintenance,

mechanical engineering, road surfacing, laboratory technology, quantity surveying, and sales and commercial operations. Positions will be based across Holcim UK sites in the Midlands, North, West, North East, South, South West and Scotland.

Hannah Lisby, people director at Holcim UK, said: "We're excited to be opening up our apprenticeship applications again this year," she said. "It is widely acknowledged across the industry we have an ageing workforce so it is really important we attract younger workers at the start of their career journey."

Henley aims for growth in military supply chain

An engineering firm in Warwickshire is preparing for a new phase of expansion after receiving wide-ranging support to modernise operations and pursue new opportunities.

Henley Engineers, founded in 1942 and based in Henley-in-Arden, has worked with Coventry and Warwickshire Growth Hub to update its digital systems, streamline processes and explore new markets, including a targeted move into the military supply chain.

The company manufactures detailed components for the commercial vehicle sector and employs 30 staff across its Henley-in-Arden site and a second facility in Redditch. With an annual turnover of £2.5 million, it is now focusing on diversification and scaling up.

Growth hub account manager Nina Bale has supported senior business development manager Mike Beirns in accessing specialist guidance, sector introductions and funding options to accelerate the firm's plans. This included a successful bid to Made Smarter West Midlands, securing a £20,000 grant towards a £70,000 investment in a new ERP and CRM system integrating procurement, sales, marketing and operations. The upgrade has reduced the time from raising a purchase order to beginning shop-floor work from three days to around 20 minutes.

Further work with Warwick Manufacturing Group has helped strengthen IT infrastructure and digital manufacturing processes, following

an expert review of equipment and workflow.

Nina said: "Nick, Mike and the team at Henley Engineers are a great example of how a business can utilise Growth Hub support at every stage of their journey. Our work is not just about grants, it's about networking, introductions and connecting businesses to the right partners at exactly the right time. Henley Engineers has embraced this fully, and their progress reflects the power of collaborative regional support."

The company is also moving towards greater automation, investing in its first robotic welding arm after specialist training at Cyber-Weld in Southam and exploring the use of a cobot capable of learning repeat welding tasks. Barcoding is being rolled out across production to improve efficiency.

Rubix acquires Airflux

Rubix, a pan-European distributor of industrial products and services, has acquired French compressed air specialist Airflux and its subsidiaries Int' Air Media and Synairgies as part of its growth strategy.

Founded in 1983 and headquartered in Lille, Airflux is the largest independent player in France's compressed air sector. The company employs around 230 people and generates approximately €50 million in annual sales. Its operations are split evenly between the sale and maintenance of air compressors.

Under the agreement, Airflux chief executive Gilles Verstraete will remain with the group for two years to oversee the transition and integration into Rubix France.

"I am delighted to welcome my new colleagues to the group," said Alexandre Labasse, chief executive of Rubix France. "Airflux complements our existing compressed air expertise to create a leading player in the French market. We can now offer our customers a broader portfolio of products and services that reduce unnecessary costs and environmental impact associated with compressed air leakage."

Gilles Verstraete added: "We're excited about the potential to build on our strong history and successful track record as part of the Rubix group. Alongside strengthening the offer available to Rubix customers, I look forward to bringing the complete Rubix multi-specialist offer to Airflux customers as we support them throughout 2026 and beyond."

In brief

The International Well Control Forum (IWCF) has introduced a framework aimed at raising global standards in non-accredited well control training across the oil and gas industry worldwide. The organisation has launched Quality Assured, a flexible endorsement designed for training that sits outside IWCF's formal accreditation scope. The framework is intended to give employers and training providers clearer confidence in the structure, relevance and quality of specialist well control courses. IWCF chief executive Zdenek Sehnal said: "Through Quality Assured, we're committed to ensuring the highest standards in well control training, providing consistency and empowering professionals. This goes beyond compliance; it's about giving the sector confidence in the training they are investing in and supports a culture of continuous development and accountability across the oil and gas industry, where well control incidents can have far reaching impact on life and reputation." The framework is built around nine standards covering course design, delivery, assessment, digital learning and workplace-based training.

The British Compressed Air Society (BCAS) has appointed Wendy Hayward, managing director of Aircare Compressor Services, as its 60th president. Hayward will lead the board for the next two years, focusing on inclusivity within the compressed air industry while maintaining high standards of quality and compliance expected from members. Hayward said: "I extend my thanks to the outgoing president, Steven Rohan. His leadership, commitment to inclusion and drive to elevate training and standards over the past two years has set a strong benchmark for the future growth of the society." She added: "I am proud to carry this work forward, particularly in the area of diversity. From our manufacturer members to our distributors, the compressed air industry is made up of a wealth of different talents. As the society's first female president, I am proud to acknowledge that these talents are celebrated and that the society continues to work hard to represent members' views."

Industrial boilers specialist Etienne Fourie argues that decarbonisation is the driving force behind the sector's current evolution, reports Louise Davis

Heated debate

Industrial boilers are big business. Research from December 2025 suggests that the global industrial boiler market size accounted for US$17.77 billion in 2025 and is forecast to hit almost US$24.96 billion by 2034. It's perhaps unsurprising that, when breaking these figures down geographically, Asia Pacific is dominating the sector, with a market share of 35% in 2024.

Aside from geographic trends, Etienne Fourie, a technical specialist at Babcock Wanson UK, explains that there's another key issue that's determining how the industrial boiler market evolves.

"Historically, the largest driver was the cost of natural gas – requiring high efficiency boilers to reduce operational costs," Fourie begins. "Although this issue still plays a role, it has been superseded in the European market. Today, decarbonisation is the key driver in the boiler and wider industrial heating sector."

Left: ***Babcock Wanson's PowerPack fire tube boilers are three-pass design with a flue gas tubular reversing chamber***

Above: ***The LV-Pack is a low-voltage industrial electric boiler specially designed to offer maximum efficiency with zero CO2 and NOx emissions***

The boilers expert observes that development of electric and hybrid boilers follows these market trends. He adds: "The availability of green electricity and the grid connections play a big role. Alternative fuels such as hydrogen have also become important, with numerous companies opting for multi-fuel solutions to diversify their energy sources."

Such market trends are reflected in the offerings from suppliers such as Babcock Wanson Group. "We have the widest range of heating solutions on the market," claims Fourie. "Starting with Firetube boilers from 250kg/h to 70,000kg/h through to coil type steam generators from 150kg/h to 10,000kg/h. We also offer water tube boilers up to 150,000kg/h and LV and HV electric boilers up to 100,000kg/h in a single boiler."

Additionally, the company offers thermal fluid heaters up to 17MW and process air heaters up to 8.5MW in a single unit. "We manufacture regenerative and recuperative thermal oxidisers, waste heat recovery boilers, heat recovery steam generators and all the ancillaries required for these systems," adds Fourie.

MANUFACTURING HEATS UP

Fourie has spent 20 years working across a variety of industries, including oil & gas, pharmaceutical and food. He says: "I'm a chemical engineer specialising in thermodynamics and fluid dynamics. In practice, I'm looking at integration of industrial heaters into manufacturing processes."

And his employer has certainly found its niche here: "Babcock Wanson engages with every kind of manufacturing company. Whether they manufacture consumer products, vaccines, chicken nuggets, fuels, metal components or aircraft parts, we supply heating solutions to suit the production line," explains Fourie.

Describing the company's global outlook, Fourie reveals: "As the largest manufacturer of industrial heating equipment in Europe, we have subsidiaries in 15 countries, each

Above: ***The E-VAP HV electric boiler from Babcock Wanson***

Right: ***Etienne Fourie, technical specialist, Babcock Wanson UK***

bringing technology that none of our competitors can match.

"Our subsidiaries are based in Europe, but we have supplied equipment to over 120 countries worldwide. We have the widest range of products and have been a market leader for over 130 years. The depth of knowledge and experience sets us apart from our competitors."

When asked about specific customers, Fourie offers a prime example of how the company's latest offerings are being used in the real world.

He says: "We are currently supplying three VAP1200RR gas-fired steam generators and three LVPack1200 electric boilers to a well-known pharmaceutical company. When green electricity is available, the design allows for near instantaneous switch-over to clean energy for the process."

HOLISTIC TREATMENT

And he highlights another recent project that illustrates the diverse work the company is involved with. "We recently supplied a three-tower regenerative oxidiser to KPMF, a specialist vinyl manufacturer, to deal with the VOCs produced in their production," Fourie explains.

"We installed two heat recovery systems to thermal fluid and hot water to minimise the carbon footprint and maximise the usage of the heat back to the process. We also installed two thermal fluid heaters to heat the printing process. It is increasingly common to take a holistic approach to processing plants, integrating different heating systems to drive efficiency and reduce environmental impacts."

This move toward a more holistic ethos can be found throughout the industry and Fourie predicts it will become a deciding factor in the future evolution of industrial boilers.

"Customers are adopting a much more holistic approach when looking at reducing carbon footprint whilst also reducing overall operational costs"

"The drive to decarbonisation and taking a hybrid approach to energy generation is key. Fired and electric heaters in a common system with integration of heating and heat recovery systems is the future. Customers are adopting a much more holistic approach when looking at reducing carbon footprint whilst also reducing overall operational costs," he says.

That latter point sums up Fourie's answer when asked to comment on the main challenges facing the sector today. "Cost of fuel and electricity is the biggest challenge," Fourie states. "There are also additional logistical costs to trade with

Left: ***Babcock Wanson thermal fluid heaters with integrated gas, oil or dual-fuel burner meet the needs of modern industry***

Europe, which is having an impact on UK manufacturing."

Indeed, Fourie observes that 2025 was particularly challenging for manufacturing: "US tariffs, the Autumn budget and business uncertainty made 2025 quite difficult for our customers. A number of projects were delayed, and overall CAPEX expenditure was reduced. That said, there were some interesting projects and 2025 was the best year for the sale of electrical thermal fluid heaters and steam boilers."

FUTURE FORECAST

So, what are Fourie's objectives looking ahead through 2026 and beyond? "The ethos of the Babcock Wanson Group is to reduce our customers' carbon footprints," he emphasises.

"Low- or zero-carbon heating systems are becoming more viable, and we have launched a number of new products here. It will be interesting to see the impact of hybrid solutions and digitisation in 2026."

The boilers specialist also notes that, as well as technical evolution, things may be moving in the right direction economically, too.

"The UK has excellent opportunities for manufacturing growth with investment in infrastructure and strengthening of grid connections. The economic forecast for 2026 is much more stable and we should grasp the chance to invest in the future," declares Fourie.

EXPANSION PLANS

In late 2025, Babcock Wanson UK announced that it had expanded its product range, introducing large-scale, high-pressure firetube and watertube boilers alongside heat recovery steam generators.

The development follows the integration of German manufacturer VKK Standardkessel into the Babcock Wanson Group. The VKK portfolio includes single and double-flame watertube boilers, hot water boilers, high-pressure steam generators with or without superheaters, and HRSGs for combined heat and power applications.

"The addition of VKK Standardkessel boilers and HRSGs significantly broadens Babcock Wanson UK's portfolio, making it unique in the UK for its capability to supply and support both firetube and watertube boilers up to the highest output levels," says Fourie.

"This positions us as the partner of choice for customers looking for energy efficiency, reliability and a full lifecycle approach to boiler house operations."

Hot shots

A veteran of the thermal imaging industry tells Louise Davis how the latest breed of tools is enabling engineering plants to improve process optimisation, monitoring, safety and energy usage

Although there's an ongoing shortage of skilled professionals in the thermography sector (more on that later), the application of industrial thermal imaging is more popular and widespread than ever before.

Assessing the current situation, Manfred Hayk, technical product and application support manager at LAND, a business of Ametek Inc, says: "Based on the latest thermal imaging detectors with high image resolution, fast response times and improved sensitivity, thermal imaging systems are increasingly being used in industrial applications."

He adds: "These are now routinely integrated into measurement systems that enable data analysis and processing of measurement data from so-called 'thermograms' using software tools optimised for process control, such as LAND's ImagePro software."

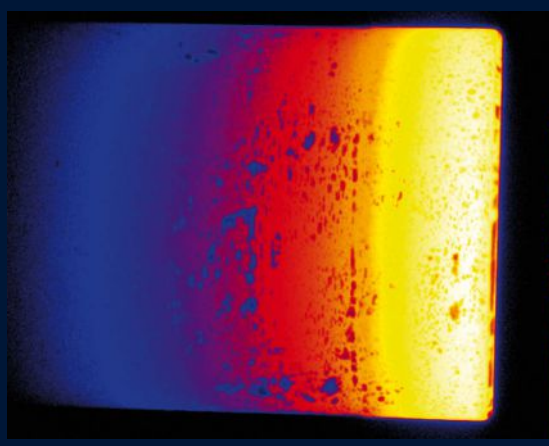
Hayk also cites another growing trend of temperature measurement data from thermal imagers being provided for remote process monitoring via open digital and analogue interface structures to process control systems and higher-level databases.

The thermography expert has more than 25 years of technical, product and application development experience in optical and infrared metrologies.

The value of this wide-ranging experience is immense, but Hayk is quick to point out that user feedback is equally important. He explains that input from end users is powerfully shaping how solutions providers such as LAND develop their next-gen thermography products.

"Our customers are increasingly demanding application-specific solutions to replace and extend traditional pyrometer point temperature measurements. Our extensive range of stationary thermal imagers and systems covers a temperature range from -20 to 2,000°C in different spectral ranges, optimised for various applications, and we employ a team of experienced physicists in Design Engineering, and engineers in our Engineered Solutions team to quickly develop customised solutions for particular process challenges," says Hayk.

And he observes that LAND is particularly well placed to action user feedback: "Our wide standard range, in-house physics team and custom



Above: ***Manfred Hayk, technical product and application support manager, LAND***

Vektor Stokart/stock.adobe.com

Left: ***The MWIR-b-640 provides a continuous and clear view, even through heavy smoke and hot furnace atmospheres, which is not possible when using visual camera systems***

engineering capability make it somewhat easier for us to adapt to this trend toward application-specific solutions."

A HOT TOPIC

This flexibility is crucial, particularly given the sheer number of thermal processes at play in industrial applications.

"Many industrial processes take place in many different applications. These include heat treatment, liquid metal tapping and melting, forming/forging along with work in furnaces and reactors – such as reheat furnaces in steel, aluminium, or non-ferrous metal rolling mills, melting and recycling furnaces in aluminium production, galvanising plants, glass melting tanks and tube furnaces in petrochemicals, hydrogen production or recycling processes," details Hayk.

"Since critical thermal processes occur inside those furnaces at up to 1,700°C, reliable and continuous 24/7 temperature measurement and visualisation are essential for process optimisation, monitoring, safety, energy saving and emissions reduction."

The LAND team is proud of the company's position as a leading manufacturer of industrial pyrometers, scanners, thermal imagers and systems, including specialised furnace cameras with automated retraction systems.

"These demanding furnace processes, including hazardous area installations, require high-quality and extremely robust solutions to ensure long-term and reliable process monitoring," Hayk emphasises.

In terms of specific products, LAND offers a variety of camera models with different temperature ranges. Hayk notes: "Cameras differ not only in their temperature range but also in their spectral range – i.e., the infrared spectrum in which they operate. Longer wavelengths in the infrared range penetrate though particles in furnace atmospheres better.

"However, absorption behaviour of furnace gases, their temperatures and environmental conditions must always be considered to achieve the best measurement results."

When asked to describe how the company's products improve operational efficiency in engineering plants, Hayk begins by highlighting that the efficiency of thermal industrial processes often relates to throughput, end-product quality, energy source usage and emissions reduction.

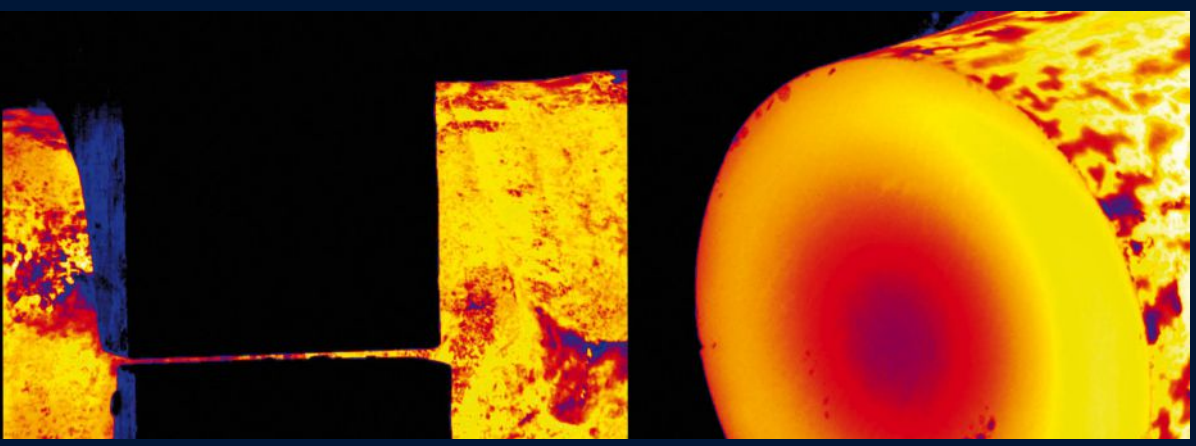
He explains: "In many industrial processes, temperature and its continuous monitoring are among the most important parameters for safe process control, optimisation and ultimately, product quality. Thermal imaging cameras and systems have the major advantage of capturing temperature visually and at the same time, the temperature with each pixel of the thermal detectors at high accuracy.

"This enables simultaneous process visualisation, detection of anomalies such as hot or cool spots, identification of temperature distributions and measurement of the goods at multiple regions of interest at the same time."

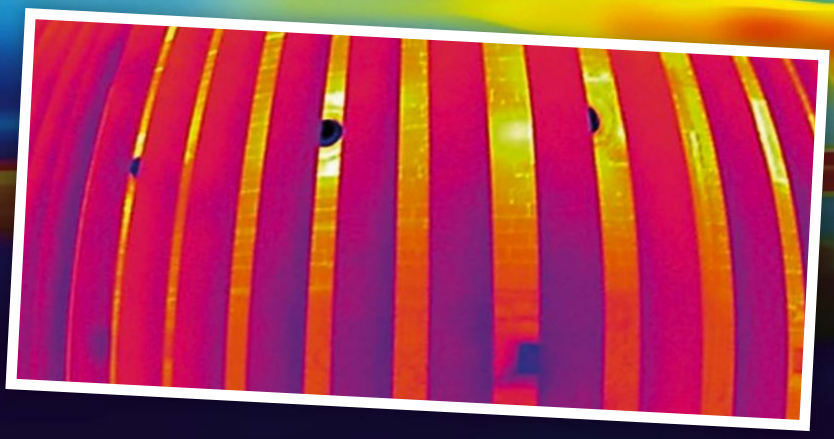
POSITIVE ENERGY

Real-world applications of LAND's technology can be found throughout the global engineering sector. "One great example we've worked on recently is with our MWIR-b thermal camera in Energy from Waste (EfW) incineration," reveals the imaging specialist.

"The borescope camera can capture images and temperature data through opaque atmospheres to help our customers identify poor uniformity on the grate surface or fouling of steam tubes"



Left: ***Induction heating and forging applications monitored with industrial thermal imagers***



"The borescope camera can capture images and temperature data through opaque atmospheres to help our customers identify poor uniformity on the grate surface or fouling of steam tubes. Small improvements in surface uniformity and fouling have a huge impact on the tube lifetime and combustion efficiency, resulting in a more profitable plant," he comments.

Efficiencies are also being realised by the rising adoption of AI-based solutions, and Hayk reports a flurry of innovation on this front. "AI has indeed entered industrial thermography, mainly due to the large amount of measurement data," he states.

"For example, a LAND NIR-2K thermographic camera generates up to three million measurement points per frame at up to 15 frames per second (fps), with each pixel radiometrically calibrated for accurate absolute temperature measurement.

"AI typically relies on large datasets from which further information can be derived and increasingly accurate predictions made. Thermal imagers serve as data sources, transmitting data to intelligent thermal imaging software for further processing.

"Our ImagePro software already includes application-specific analysis functions supported by integrated AI, with continuous self-learning capabilities."

Hayk says that a prime example of such work involves predicting the development of not-yet-melted glass surfaces in a glass melting tank: "We offer a complete furnace thermal imaging camera system for such tanks, combined with ImagePro Glass software optimised for the process and process control."

He adds: "We have also improved our furnace thermal imager cooling systems by using AI to develop FlowPro, a computational fluid dynamics (CFD)-based software tool to determine the camera component temperatures at a variety of cooling media flows, meaning we can help customers deploy our camera systems with a high level of confidence and a lower total capital expenditure (CAPEX)."

Above: ***NIR-B-640-EX hazardous area furnace imager in tube reformers***

BEHIND THE CAMERA

Advanced products are one thing; having sufficient qualified personnel to use them is another issue entirely – and unsurprisingly, its one that Hayk has been giving much thought to.

"The demand for skilled professionals in thermography is a widely discussed issue across industries, and it depends on expectations and willingness to invest. In our field of industrial non-contact temperature measurement, we need committed engineers and technicians open to technology," says the industry veteran.

"LAND benefits from having many experienced employees with extensive process, product and application knowledge, which is passed on to our new hires. Additionally, practical experience at customer sites accelerates learning for new colleagues."

LAND also takes a proactive approach to sharing its knowledge with younger generations. "We maintain close relationships with schools, colleges and universities to recruit new employees and attract fresh talent to the thermography sector," reports Hayk.

When considering the future of the industry, the thermography specialist warns that both new and existing personnel must maintain a questioning, proactive mindset to ensure ongoing success.

Expanding on this point, Hayk says: "As the complexity of the AI-driven analysis increases, skilled professionals will be required to ask important questions. These include: does the analysis make sense? what boundaries should the automation operate within? and what is the integrity of the initial dataset, and is it properly filtered and processed?"

He predicts: "Eventually, AI will likely make these decisions but there are many years, if not decades, of skilled human monitoring and intervention required before we reach that point." oe

IN THE PIPELINE

Discussing upcoming developments in industrial thermography, Hayk says that although most people assume higher pixel resolution (as we can see in the evolution of smartphone cameras) is something manufacturers are working on, this isn't necessarily top of their R&D list.

"Industrial thermal imaging cameras primarily measure temperatures and reliably monitor processes. Higher resolution would significantly increase data flow, challenging process networks," he explains.

"Future developments will focus more on thermal detector sensitivity and advanced data processing, including AI integration. This also involves intelligent software tools and handling large datasets for analysis and process control."

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John Baxter FSOE FIPlantE CEng CEnv

Society of Operations Engineers

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Combatting wastewater spillages

Erik Larsen, product marketing manager at Aquatic Informatics, looks at how the use of modern management systems can combat wastewater spillages

As weather severity increases around the globe, heavy, and more regular rainfall events are giving rise to greater and more sudden volumes of runoff leading to overwhelmed sewage networks and increased instances of spillage into streams and rivers.

UK regulators are stepping up compliance requirements for such effluent spillages resulting in more water companies requiring, and improving, flow monitoring programs to gain a better understanding of how their assets are performing.

To keep wastewater flowing through these pipelines, whilst maintaining environmental compliance, OnSite Central provides specialist flow monitoring services. This includes the installation of loggers and sensors to gather large amounts of field data combined with in-depth analysis to provide water companies with valuable operational insights when and where they need it most.

Jack Tingle, data analyst for OnSite Central, explains: "In the last couple of years, within the UK utilities sector, we have noticed a shift in demand from short-term flow surveys to permanent level monitoring. With data loggers now being more affordable and available alongside stricter regulatory demands, water companies are installing their own devices at a scale never seen before in the UK. These devices bring large amounts of data into SCADA systems, but customers are having difficulty processing this data to deliver valuable insights."

After several iterations, OnSite currently uses Aquatic Informatics' Aquarius software data platform. Asmat Akhtar, data supervisor for OnSite Central says: "It is proving to be reliable, and the program's API has enabled us to integrate tools that we have already developed containing valuable existing data.

Above: ***Erik Larsen, product marketing manager at Aquatic Informatics***

"For example, we have an application that our crews use to do their job in the field, by connecting to Aquarius, crews can seamlessly view that data and garner insights to perform their jobs better i.e., more efficiently and more effectively, without any human intervention."

Flow monitoring equipment measures the depth of flow and velocity in pipelines, which, when combined with metadata such as rain gauge information, can be used by hydraulic modelling engineers to assess the hydraulic performance characteristics of a particular pipeline.

Good, reliable data enables asset owners to be more proactive when alerted by unusual flows, for example, implementing timely targeted mitigation measures due to a more accurate and informed prediction of outcomes. OnSite transfers data into Aquarius from a combination of customer SCADA systems, and logger manufacturer platforms. The Aquarius software can process these large amounts of data efficiently, perform QA/QC, and using complex algorithms, provide meaningful information in a visually easy-to-understand format.

AUTOMATION DRIVE

Where possible Akhtar's team automates functionality, for example, if a data feed coming in from a site looks poor, a reporting tool in Time-Series will identify

Above: ***Flow monitoring equipment measures the depth of flow and velocity in pipelines*** *(Picture credit: OnSite)*

that something doesn't look right. By checking a few boxes, it generates a schedule for the crew with a snapshot graph and instructions.

Some of the instructions are automatic, for instance, if a sensor loses connectivity, it automatically polls Time-Series and pushes those results to the team. This kind of automation enables OnSite to maintain a relatively small team, producing big results.

Anytime Akhtar's team can avoid manual data entry, they do, as it removes the possibility for human error and frees up personnel to spend more time on performing analysis that can lead to action and planning.

"For a person to manually set up 100 newly installed loggers in a software program is tedious and requires a lot of time," says Tingle. "We want our people to spend time looking at the data, not doing administrative tasks. As we are already collecting the information digitally by our survey teams, we have developed a process to transfer that existing data into Aquarius.

"By using the program's API, we can provide the platform with data we have already collected. With one click, in a few we can get all the site data populated in Time-Series – it's ready to go."

QUALITY CHALLENGE

Measuring flow in wastewater is particularly challenging because the precision of any measurement is heavily dependent on the fluid properties. Flow conditions can be quite different in wastewater lines with often shallow turbulent water, which is very difficult to measure. Wastewater pipelines can also have a lot of solid materials and detritus that can get caught on sensors and/or lead to sewage blockages.

Results can vary dramatically from one day to another. To address this the software has a unique portfolio of tools for error detection, data cleansing and flagging, automatic bias corrections, and rating shift management.

Much of these automated procedures eliminate the majority of tedious manual data workup processes. With streamlined QA/QC capabilities and a rich audit trail, OnSite can rely on the information to be accurate, timely, and defensible.

Tingle says: "The new program gives us a lot more confidence in our data reports, which is not easy in wastewater applications in an uncontrollable environment. Better data leads to better decision making."

OnSite has a plethora of sensors to measure and monitor parameters in wastewater pipelines and is currently investing in non-contact radar for measuring flow and velocity. This is an exciting technology where the lack of an intrusive sensor can help improve data quality and reduce the number of confined space entries into a hazardous environment.

By monitoring flow over longer periods, OnSite now has a history in Aquarius for events such as dry or wet periods and can average out what optimal flow rates to expect if values drop outside of those ranges and can set an alert to flag a potential issue. Historic data amplifies the value of today's data both for prediction and identification of probable causes for unusual or poor data.

Modelling needs from short-term surveys that may require around 500 loggers, is not much different from long-term monitoring that can have tens of thousands of loggers, but managing the data requires high-speed processing, automation, organisation, and storage. The new program allows the OnSite analytics team to sort and layer data sets on top of each other and choose a variety of graphing tools to provide a rich story behind the numbers.

STREAMLINING DATA

OnSite is in the early stages of using WebPortal which enables stakeholders to access their data online from any connected device. Tingle's team manages how this data gets used and by whom. Information can be displayed on custom dashboards or maps, show alerts and provide live reports, empowering stakeholders with useful timely information for decision-making.

As the wastewater industry and technology continues to evolve, cloud solutions can keep up with the changes in the background and alleviates OnSite from having to maintain their own servers and software updates. "Because Aquarius is hosted in a secure environment with the latest in data security, we are immediately security compliant," says Akhtar.

As wastewater systems and regulators step up the monitoring of spillage into the environment, having access to reliable data will help keep wastewater flowing and identify solutions for increasing capacity to ensure all effluent makes it to treatment plants first.

The British water sector is on the midst of the biggest reform in decades. Tom Austin-Morgan looks at the reasons why and how the solutions will be implemented

Rebuilding British water

For decades, the UK's water system has been sustained by incremental upgrades to ageing assets. Today, that approach is no longer tenable. Rising population pressures, climate volatility, public outrage over sewage pollution and mounting financial stress within water companies have converged to expose an industry that the previous Secretary of State for the Department for Environment, Food and Rural Affairs (DEFRA), Steve Reed, described as "broken."

The result is the most ambitious reform agenda the water sector has seen since privatisation, one that combines sweeping regulatory change with an unprecedented programme of infrastructure investment. For operations engineers, this moment represents both a reckoning and an opportunity: the chance to rebuild Britain's water system on firmer, more resilient foundations.

BREAKING POINT

The political consensus is that fragmented regulation, weak accountability, and decades of underinvestment in physical assets have combined to undermine both environmental outcomes and public trust.

Sewage discharges into rivers and coastal waters have become the most

Left: ***Anglian Water supplies more than one billion litres of water every day*** *(Picture courtesy of Anglian Water)*

visible symptom of this failure, but the underlying challenges run deeper. Large sections of the sewer network are operating beyond their original design life, treatment works struggle to cope with storm events, and leakage remains stubbornly high despite years of efficiency programmes.

Against this backdrop, ministers have committed to reforms designed to restore confidence, unlock investment, and drive long-term operational improvement. The Government has secured £104bn of private sector funding to rebuild the water network.

However, the National Audit Office has said that Britain's water infrastructure will require £290bn of investment to meet government targets over the next 25 years but ministers and sector regulators have no coherent plan for delivery. It added that if the rate of mains replacement remained as slow as it is now, it would take 700 years for the network to be replaced.

REGULATORY REFORM

At the heart of the Government's strategy is a radical restructuring of water regulation. Ofwat, the economic regulator since privatisation, is set to be abolished and replaced with a new single water regulator. This body will bring together responsibilities currently split across Ofwat, the Environment Agency, the Drinking Water Inspectorate and Natural England.

The intention is to simplify oversight, close regulatory gaps and ensure that environmental performance, customer outcomes, and financial resilience are addressed in a more integrated way.

According to DEFRA, the reforms will make regulation simpler, increase openness and accountability, and give the industry the stability it needs to attract investment and accelerate economic growth.

These proposals align closely with the findings of the Independent Water Commission, chaired by Sir Jon Cunliffe. Its final report sets out 88 recommendations aimed at delivering what he called a "resetting" of the sector, including clearer long-term planning, stronger oversight of company ownership and governance, and improved transparency around performance and investment delivery.

He said: "In countless conversations in the last nine months I have been struck by the urgent need and passion for change. Doing this will require hard work, strong leadership and sustained commitment. But it can and must be done."

British Water has welcomed this direction of travel. Its chief executive, Lila Thompson, said: "There can be no question that the sector is turning a corner in terms of the narrative coming from government and regulators.

"Attracting top talent to the sector, and retaining this highly skilled workforce, is essential if we are to deliver these huge programmes of works, so that narrative really matters," Thompson said, before adding: "Our goal is to work ever more collaboratively, with utilities, regulators, innovators, suppliers and other groups, to meet the challenges and opportunities shaping the future of the water sector."

Right: ***Government Water Minister Emma Hardy signalled the shift to a spirit of collaboration and celebration of water sector successes in a keynote address to the British Water Annual Conference, in November 2025*** *(Picture courtesy of British Water)*

British Water has also reported Government support for the Commission's recommendation to establish a so-called "super-regulator," reflecting growing consensus that the existing regulatory architecture is no longer fit for purpose.

ACCOUNTABILITY AND ENFORCEMENT

Alongside structural reform, ministers are tightening enforcement. The Water (Special Measures) Act bans bonuses for water company executives at firms responsible for serious pollution incidents and introduces criminal liability for executives who obstruct investigations.

The Environment Agency has also been granted stronger monitoring and enforcement powers.

Crucially for operators and engineers, customer bills are now being ringfenced for infrastructure upgrades. DEFRA states that money earmarked for investment "must now be spent on new sewage pipes and treatment work – not spent on shareholder payments or bonuses".

This is intended to ensure that promised capital programmes translate into physical assets on the ground.

A new statutory water ombudsman is also planned, giving customers stronger recourse when service standards fall short. Together, these measures are designed to rebuild public trust, a prerequisite for the long-term stability the sector needs.

INFRASTRUCTURE CHALLENGES

The implications of this infrastructure challenge are profound. Delivering this programme will involve extensive renewal of sewer networks, expansion and modernisation of wastewater treatment works, construction of new storage assets, and greater integration of digital monitoring and control systems.

One of the clearest lessons from recent years is that compliance-driven investment is no longer sufficient. Climate change is increasing the frequency and intensity of storm events, placing combined sewer systems under stress they were never designed to withstand. At the same time, population growth and urban densification are increasing baseline demand.

Engineering solutions must therefore prioritise resilience and adaptability. This includes larger and more flexible storage capacity, smarter network management using real-time data, nature-based solutions to reduce runoff, and treatment processes capable of coping with variable flows and loads.

British Water has emphasised the role of technology in enabling reform, noting that digital tools and data transparency will be critical to delivering regulatory expectations and operational efficiency. Asset condition monitoring, predictive maintenance, and improved hydraulic

modelling all have a role to play in maximising the impact of investment.

British Water said: "The task now is not to just comply with the 88 recommendations but to deliver the systemic enablers that make reform real."

SKILLS, CAPACITY AND RISK

Delivering this transformation will depend not only on capital but on people. The Government has convened a Water Skills Strategic Group to ensure the industry has the engineering, construction and operational expertise required to deliver the programme. Ministers estimate that around 30,000 new jobs will be needed across the sector.

Water Minister, Emma Hardy has linked skills directly to reform delivery, stating that the overhaul of the sector must be matched by workforce capability to ensure "record investment goes where it's needed most to clean up our rivers, lakes and seas".

For operators, this raises questions about supply-chain capacity, training pipelines, and the ability to deliver complex programmes without compromising day-to-day performance. The risk of delivery bottlenecks is real, particularly if multiple major projects compete for the same specialist skills and resources.

FROM REFORM TO RESULTS

The ambition behind the Government's water reform agenda is clear. Fewer regulators, stronger accountability, tougher enforcement, and record investment all point to a sector in the midst of deep change.

Yet the success of this agenda will ultimately be judged not by legislation or announcements, but by outcomes: cleaner rivers, fewer pollution incidents, more resilient infrastructure, and improved customer confidence.

The challenge is to translate policy intent into practical, durable engineering solutions and to ensure that this once-in-a-generation investment delivers assets that are fit for the environmental, operational, and societal demands of the future.

If reform and engineering delivery can move forward in lockstep, the UK water sector may finally be able to move beyond crisis management and towards long-term sustainability.

WATER REFORMS

Last month, DEFRA launched what is said is a "new once-in-a-generation plan" to overhaul the water system and protect households from disruption. The Water White Paper sets out clear powers for the new regulator, delivering tougher oversight and stronger accountability for water companies.

For the first time in two decades, a Chief Engineer will sit inside the new single water regulator. Their job is to bring back the hands-on checks of water infrastructure Ofwat has failed to provide, ending the days of water firms marking their own homework, resulting in crumbling pipes and unreliable services.

The new regulator will introduce an 'MOT' approach for water company infrastructure, requiring health checks on pipes, pumps and more. DEFRA said this "forward-looking approach" means no more waiting to act, spotting problems before they happen and preventing water shortages.

These reforms put prevention first, requiring companies and bosses to plan for the long-term. Where companies fall short, a new Performance Improvement Regime will give the regulator the power to act fast and fix failures so that underperforming water companies recover faster, protecting customers and the environment and giving stability to investors.

At the same time, a roll-out of smart metering and mandatory efficiency labels on items like dishwashers and washing machines will help households monitor their water use and cut costs – delivering savings of over £125 million on water and energy bills over the next decade.

Building on last year's plastic wet wipes ban, the White Paper prioritises pre-pipe solutions that tackle the root causes of pollution through sustainable drainage, rainwater management, and cracking down on sewer misuse.

Right: ***Cement is a critical construction material, but its production gives rise to CO_2 emissions***

The development of carbon capture and storage (CCS) facilities represent a solution to decarbonising heavy industries. Work has now started on a carbon capture facility in Wales to enable fully decarbonised cement production

Net zero cement

Cement is a critical construction material, but its production gives rise to CO_2 emissions and in a world where every process needs to be more sustainable a solution to reduce this is vital to ensure the globe can keep building.

The glue in concrete, cement is the most widely used building material in the world, but its emissions result from the chemical process involved in cement's manufacture, so cannot be avoided by using low carbon or renewable energy sources.

The only way to remove CO_2 emissions and produce the net zero cement the UK needs is to capture them using carbon capture and storage (CCS) before they enter the atmosphere.

CCS is a safe and proven technology that captures carbon dioxide where it is being produced and locks it away, preventing it from being released into the atmosphere, where it is a major contributor to climate change.

Heidelberg Materials opened the world's first carbon capture facility at a cement works at its Brevik site in Norway in June last year, where 50% of the plant's CO_2 emissions are being captured as part of the Norwegian government's Longship programme.

The company has now reached an agreement with the UK government to build the world's first carbon capture facility in north Wales to enable fully decarbonised cement production and construction work started on the facility in late 2025.

The CCS project at the company's existing cement works at Padeswood in north Wales will enable production of evoZero carbon captured net zero cement for the construction industry in 2029.

NET NEGATIVE PRODUCTION

The carbon capture facility at Padeswood is designed to capture almost all (around 95%) of the CO_2 emissions from the process. The emissions captured from the kiln include biogenic CO_2 from biomass fuels, mainly from domestic food, wood and paper wastes that cannot be recycled, which could allow the cement produced at Padeswood to be net negative.

Biomass is carbon neutral as trees and crops remove CO_2 from the atmosphere as they grow by storing it within their cells. Any CO_2 released from these materials in the kiln would also be captured by the carbon capture facility. As a result, the capture of biogenic CO_2 could allow the cement produced at Padeswood to be net negative.

The carbon captured at the Padeswood CCC will be compressed and transported via an underground pipeline for secure storage under the seabed in Liverpool Bay as part of the HyNet northwest project, where these emissions will be stored in depleted oil and gas reservoirs under the seabed.

Above: ***The CCS facility at Padeswood will capture around 800,000 tonnes of CO_2 a year from Heidelberg Materials' existing cement works***

Left: ***Simon Willis, CEO Heidelberg Materials UK***

HyNet is a UK industrial decarbonisation project charged with unlocking a low carbon future across the northwest of the UK – creating new roles, safeguarding existing jobs, growing a skills base and attracting investment into the region.

The HyNet network claims that it will reduce the amount of carbon dioxide emitted from across the region by a quarter by capturing carbon dioxide emitted by heavy industry.

GROWTH DRIVER

Heidelberg Materials' CCS project is set to create economic benefits to north Wales through investment and job creation with it forecasted protect over 200 jobs and create around 50 new ones, as well as up to 500 more during construction.

The funding decision aligns with the UK Government's ambitions to reduce CO_2 emissions and deliver economic growth through construction.

Heidelberg Materials is one of the world's largest integrated manufacturers of building materials and solutions with leading market positions in cement, aggregates, and ready-mixed concrete.

Simon Willis, CEO at Heidelberg Materials UK, explains: "Our constructive partnership with the UK Government has allowed us to reach this major milestone, which is fantastic news, not just for us, but for the industry as a whole.

"Our new facility at Padeswood will be a world-leader. It will capture around 800,000 tonnes of CO_2 a year from our existing cement works, allowing us to produce evoZero carbon captured net zero cement, which will help the UK construction industry reach its decarbonisation aims.

"CCS is a growing sector worldwide and our Padeswood project is an exemplar, helping position the UK as a global force at the forefront of this technology. It will also pave the way to decarbonising our domestic cement industry, helping it remain competitive while mitigating against climate change."

Michael Shanks, Energy Minister in the Department for Energy Security and Net Zero, says that the government's "clean-energy mission" means good jobs, regional growth, and investment for local communities.

He adds: "This trailblazing cement works showcases the north Wales workforce on the global stage – leading the charge in the clean industries of the future and powering Britain's reindustrialisation through this UK-first project."

Make real-time monitoring standard

It takes a simple sensor to save power systems from massive failure.

By Dave Meyers, CEO at H2scan

Across the world, power grids are under mounting pressure from aging equipment, rising demand, and the push toward electrification. Transformers, too often taken for granted as the essential lynchpin of today's technologically interdependent world, are carrying heavier loads for longer periods, often with minimal oversight.

Transformers are essential for powering virtually everything electrical, but many are now decades old and struggling to keep up. As electricity demand rises faster than infrastructure upgrades, the risk of failure is growing.

When dealing with such critical infrastructure, it can be dangerous to wait for something to go wrong before taking action. But all too often, investment in maintenance comes only after a fault has already caused major damage, leading to blackouts, financial loss, and public safety risks.

A fire near Heathrow Airport earlier last year showed just how devastating a single transformer failure can be. The incident triggered a massive blackout, grounding more than 1,300 flights and cutting power to over 66,000 homes. Losses were estimated at more than £100 million.

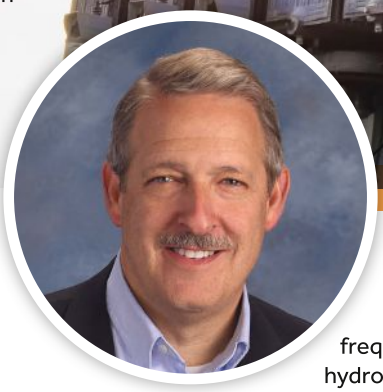
Later investigations suggested that early signs of insulation failure had been detected years before, but nothing was done to remedy the fault. What could have been a routine fix turned into a national crisis.

Heathrow was not an isolated event. The UK recorded eight transformer fires in just 10 weeks during a period last year. Similar problems have been reported in North America and Asia, where transformers installed in the 1960s and 1970s are still in use.

Nearly 40% of Britain's transmission equipment predates 1975, and more than half of USA transformers are over 40 years old. Replacements are slow and expensive. In the USA, the wait for a new transformer can stretch up to four years.

This mismatch between aging assets and limited supply is creating a dangerous vulnerability. The UK's National Energy Systems Operator expects electricity use to rise by 30% by 2035, driven by electric vehicles, data centres, and the electrification of industry.

Similar patterns are emerging everywhere. The challenge is that utilities cannot simply replace every aging transformer, they must find smarter ways to protect and extend their life.



Left: ***Dave Meyers, CEO at H2scan***

MONITORING MATTERS

One of the most effective transformer fleet-wide solutions is hydrogen monitoring. When components in the main tank begin to deteriorate, hydrogen gas is one of the first warning signs. It forms when abnormal heating occurs, typical of insulation breakdown or acting events inside the transformer. In the past, operators would send oil samples to labs once a year (sometimes less frequently) to assess the hydrocarbon gas levels. But this method leaves long gaps between manual sampling, allowing incipient faults to grow unnoticed.

Modern hydrogen sensors have changed that. These small, affordable devices can be attached directly to transformers to provide continuous, real-time monitoring. They send alerts the moment hydrogen levels begin to rise, giving operators valuable time to act before a minor issue turns into a major failure. Costing only a few thousand dollars, each sensor can save millions by avoiding premature transformer failures or even blackouts.

Real-time hydrogen monitoring also turns maintenance from reactive

Left: ***Transformers are essential for powering virtually everything electrical, but many are now decades old and struggling to keep up***

to proactive. Instead of rushing to fix problems after a failure, utilities can plan repairs or replacements in advance. This not only cuts costs but also improves worker safety and keeps critical services, like hospitals, airports, and data centres, running without interruption. Extending transformer life by even 10 to 20% can make a major difference, especially when new units can take years to arrive.

Studies also show that predictive maintenance enabled by continuous monitoring can reduce maintenance costs by up to 25%. Each avoided outage saves millions in lost revenue and prevents damage to a utility's reputation.

Some still worry that installing sensors adds complexity or cost, but in practice, the opposite is true. These devices detect hydrogen in very small amounts, just parts per million, providing early and accurate warnings. Installation takes only a few hours and does not require shutting down the transformer. The data can be viewed remotely, allowing for automatic alerts and quick analysis. Many utilities recover the cost of investment within a few years (sometimes less).

Above: ***A fire near Heathrow Airport earlier last year showed just how devastating a single transformer failure can be. The UK recorded eight transformer fires in just 10 weeks last year***

The Heathrow fire highlighted not only technical issues but also communication gaps.

Maintenance teams had warning data, but it was fragmented and delayed. Real-time hydrogen monitoring removes that blind spot. It provides transparency, ensuring that warnings are seen and acted upon immediately. For regulators, this visibility strengthens oversight and helps ensure accountability.

In developing regions such as Africa, South Asia, and Latin America, the case for adopting hydrogen monitoring is even stronger. Many of these countries face rapid growth in electricity demand but limited budgets for infrastructure upgrades.

For them, installing sensors can extend the lifespan of existing transformers and prevent costly outages. It is an affordable way to build resilience without waiting for large-scale modernisation programmes.

THE ROLE OF MONITORING

Hydrogen monitoring also plays a key role in supporting renewable energy integration. As grids absorb more solar and wind power, they become more complex and variable.

Transformers must adapt to fluctuating loads, which increase stress and the risk of failure. By giving operators continuous insight into asset health, hydrogen monitoring helps maintain stability and supports the global shift to cleaner energy.

Ultimately, a small sensor can make a big difference, making incidents entirely preventable. The technology exists: it is reliable, affordable, and ready to deploy.

The question is no longer "Should utility install single gas monitors?" but "How soon can they get started?" What is needed now is urgency and commitment from utilities, policymakers, and regulators to make real-time monitoring a standard part of power grid management.

Key to the career path

Why everyone seeking positions of engineering responsibility needs to become professionally registered as EngTech, IEng, or CEng

Having everyone in positions of engineering responsibility Engineering Council registered as Engineering Technician (EngTech), Incorporated Engineer (IEng), or Chartered Engineer (CEng), or holders of a recognised international equivalent, would help the whole of society benefit from advancements in professional engineering practice and the positive impacts it provides.

Besides the whole of society benefiting, those conducting engineering do themselves benefit from being professionally registered as EngTech, IEng, or CEng. Principally, through attaining an internationally recognised, respected and transferable qualification of professional engineering competence and commitment.

Such a qualification is already a requirement to conducting engineering in some jurisdictions. Thus, being EngTech, IEng, or CEng positively supports an individual's career progression and standing, be that in engineering or otherwise.

In the UK, the EngTech, IEng and CEng titles are protected. This means you can only use these titles if you have achieved and operate to an appropriate standard of professional engineering competence and commitment and are registered with the Engineering Council.

Therefore, you have a protected qualification that confirms your professional competence and a commitment to professional ethics and practice. This gives you the edge when seeking new employment, through reducing the risk for potential employers as they search for someone to take a position of engineering responsibility.

CAREER PROGRESSION

If you are serious about taking the management/leadership career route, IEng and CEng are the professional engineering qualifications to aim for.

Working in management may encompass overseeing projects or teams. As you climb the engineering career ladder, you will be responsible for innovating and developing new solutions or technologies.

Regardless of your aspirations, individuals in management or leadership positions are required to exhibit professionalism and dedication to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their field, serving as role models and establishing benchmarks for their teams.

People skills are essential as you lead projects or teams. The Engineering Council has laid out key competencies related to interpersonal skills expected from managers and leaders. Three of the five competencies of the UK Standard for Professional Engineering Competence and Commitment (UK-SPEC) are focused on people skills.

Our 'Pathways to Progress' guide is a roadmap to infinite opportunities - whether you are progressing upwards or diversifying into new disciplines or sectors. Crafted by a consortium of industry experts spanning various sectors, this meticulously curated guide serves as a comprehensive tool aiding in career progression and unlocking fresh opportunities within the engineering field.

For a free copy, visit our 'Pathways to Progress: Navigating Career Growth in Engineering' guide, where you can discover where to take your career next. *(www.tinyurl.com/a4hpfdvh)*

KEY STEP

Joining a Professional Engineering Institution (PEI) is a key step in a professional engineering career. When starting a career in engineering and before you have attained the appropriate levels of training, qualifications and experience to be professionally registered with the Engineering Council, you need to join a PEI, such as the Society of Operations Engineers (SOE).

This so that you can sign up to a PEI code of professional conduct and commence Continuing Professional Development (CPD).

PEIs' codes of professional conduct are based on the Statement of Ethical Principles for the engineering profession, which sets out four fundamental principles for ethical behaviour and decision-making.

CPD helps you keep up to date with developments and advances in engineering and is an aid to your ongoing development. It can also help give assurance to your employer that you are working to achieve and maintain appropriate levels of competence and responsibility.

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Multiplexed gas analysers can lower costs

A gas analyser is not just for regulatory compliance. James Clements, managing director at Signal Group, explains how businesses can extract maximum value from an investment in gas analysis

Using total organic carbon (TOC) measurements at thermal processes as an example, the same gas analysers can also be utilised for process control and for checking the performance of abatement equipment.

By the time a continuous emissions monitoring system (CEMS) measures a process stream for compliance, the process work is done, and the analysers are simply providing proof that the process is complying with its permit. However, the efficiency with which that compliance is achieved can be substantially improved by monitoring at earlier stages in the process stream.

This principle applies to almost all regulated processes with emissions to air, and for a variety of measurement parameters. For the purposes of this article, we will take a closer look at thermal oxidation processes such as VOC abatement and incineration.

Incineration is a widely adopted method for dealing with materials such as municipal waste, sewage sludge, clinical and hazardous waste, and animal by-products. The advantages of incineration over other waste disposal methods include significant volume reduction, hazardous material neutralisation and energy recovery. However, the process of incineration converts much of the solid waste into gases, so tight regulatory limits apply to air emissions.

Under the Industrial Emissions Directive (IED) incinerators are normally required to continuously monitor emissions of carbon monoxide (CO), hydrogen chloride (HCl), hydrogen fluoride (HF,) nitrogen oxides (NOx), sulphur dioxide (SO2), total organic carbon (TOC) and total particulate matter. Under certain circumstances, continuous monitoring of HCl, HF and SO2 may not be required, and periodic monitoring may be applicable.

The specific requirements for continuous or periodic monitoring are detailed in a site's EPR (Environmental Permitting Regulations) permit. The permit also specifies periodic monitoring frequencies for dioxins and furans, dioxin-like PCBs (polychlorinated biphenyls), heavy metals and poly aromatic hydrocarbons (PAHs).

Above: ***James Clements, Signal Group managing director***

Following the withdrawal of the UK from the EU, the requirements of the IED have been maintained in UK law through the Environmental Permitting Regulations. Seeking to minimise the impact of pollution on people's health and the environment by reducing harmful industrial and intensive livestock emissions across the EU, the revised Industrial and Livestock Rearing Emissions Directive (Directive 2010/75/EU or 'IED 2.0') entered into force on 4 August 2024.

A key feature of IED 2.0 is the mandate for national authorities to set Emissions Limit Values (ELVs) at the "strictest achievable" level within the BAT-AEL range for a specific installation, unless the operator demonstrates that this is disproportionately costly. As a consequence, ELVs will become tighter.

THERMAL OXIDATION

Incinerators employ high temperatures to break down complex organic chemicals into simpler forms - ideally water and carbon dioxide. Measurement of TOC emissions is necessary, not just to demonstrate compliance with the site's permit, but also to help to identify

Left: ***Incineration is a widely adopted method for dealing with materials such as municipal waste, sewage sludge, clinical and hazardous waste, and animal by-products. Pictured is an incinerator in Germany*** *(Picture credit: Signal Group)*

Above: ***Signal MCERTS approved 363SM heated pre-filter with heated line*** *(Picture credit: Signal Group)*

incomplete combustion, which reduces efficiency and increases the risk of non-compliance. The incomplete combustion of some materials, such as plastics, can also result in the production of toxic gases, which emphasises the need for monitoring and feedback control.

Nitrogen oxides (NOx) are worthy of mention in this context because nitrogen and oxygen are abundant in air but do not react in ambient conditions. At higher temperatures, the gases react to form nitrogen oxide (NO) and nitrogen dioxide (NO2), which have serious health and environmental effects, and are therefore tightly regulated.

There is a direct connection between combustion process temperature and NOx emissions, so Signal supplies NOx analysers to inform process control. Offering higher levels of accuracy, Chemiluminescence is the preferred measurement method for development engineers at manufacturer laboratories working on new technologies to reduce NOx emissions in the combustion of fossil fuels. For regulatory compliance monitoring, NDIR (Non-Dispersive Infrared) is less costly and more commonly employed.

Process managers seek to avoid incomplete combustion by optimising temperature, residence time and the air/fuel mixture. This process is informed by measurement of parameters such as oxygen, carbon monoxide and VOCs.

VOC ABATEMENT

Thermal oxidation is generally more effective at higher temperatures and with longer residency times, but both of these involve a higher energy requirement, increasing costs and reducing sustainability in the face of rising climate concerns.

In a catalytic combustion system, VOCs are decomposed by thermal oxidization at lower combustion temperatures, which reduces the amount of auxiliary fuel required and can reduce NOx generation. However, there is a risk that the efficacy of the catalyst may be lost due to catalytic poisoning.

VOC monitoring before and after abatement is essential for the optimisation of abatement efficiency, and for the detection of potential problems.

MULTIPLEXED GAS ANALYSERS

Signal's extractive gas analysers can be multiplexed, and can be connected to a multipoint sampling system so one gas analyser can sequentially take measurements from multiple points – before and after abatement.

To achieve this, Signal has developed a range of ancillary equipment to facilitate sampling from multiple points. For example, Signal's Model 362 splits a single heated sample line into two filtered streams, allowing for parallel analysis of two different sample points. It includes a heated pump, gas distribution manifold, and multiple outputs, including one for a cooler/dryer. This facility to use one analyser for multiple sample points dramatically lowers the cost per measurement location.

MONITORING TECHNOLOGY

Process managers are free to select the most appropriate gas analysis technique for process control, but where data are required for compliance purposes, it is likely that a certified standard reference method gas analyser is deployed. For example, the standard reference method for the measurement of TOC is flame ionisation detection (FID).

Signal's latest FID, the SOLAR CEMNEX, recently passed a rigorous program of tests at TÜV in Germany. As a consequence, this monitor has MCERTS approval verifying compliance with the performance and uncertainty requirements specified in the UK's Environment Agency Guidance: MCERTS for stack emissions monitoring equipment at industrial installations - Continuous emissions monitoring systems (CEMS) Updated 28 August 2024, EN 15267-1:2023, EN15267-2:2023, EN 15267-3:2007 and QAL 1 as defined in EN 14181: 2014.

Process managers know and understand the measurement parameters that can help them to optimise their processes, but they may not be fully aware of the most effective and cost-efficient ways to implement a monitoring system.

AGVs optimise agricultural centre

A German agricultural machinery manufacturer has deployed an automated guided vehicle (AGV) system from Ek Robotics to optimise material flow at its newly opened spare parts centre.

The facility, which houses an automatic high-bay warehouse with around 21,600 storage locations, uses 10 Move transport platforms to move goods between transfer stations and picking areas. Operating on a two-shift schedule, the system aims to tackle industry challenges such as labour shortages and rising costs through automation and process reliability.

The X Move 1200 series vehicles, equipped with lifting beams capable of handling loads up to 1,200 kg, transport pallets and mesh boxes

along a 300-metre route using contour navigation supported by reflectors. "The X Move vehicles achieve high throughput even in the most confined spaces," said Ronald Kretschmer, chief sales officer at Ek Robotics. He added it aims to operate 200 transports per hour to ensure maximum availability for decades to come.

The decision was influenced by early material flow simulations demonstrating the system's scalability, as well as a reference visit to Rittal in Haiger, Germany. The combination of compact vehicle design, reliable navigation, and data-driven planning is expected to reduce total cost of ownership and support future expansion.

Octavia unveils direct air capture plant

Octavia Carbon, the Global South's first direct air capture (DAC) company, has commissioned the world's second DAC and geological storage facility, powered by Kenya's geothermal energy.

The plant captures carbon dioxide directly from the air and stores it securely underground, using a modular and scalable process designed to accelerate carbon removal at lower costs. Founded in 2022, Octavia now employs more than 60 people and aims to deliver durable carbon removal while promoting green industrial growth and climate justice in Africa.

The announcement comes after the Africa Climate Summit in September 2025, which called for positioning Africa as a driver of climate solutions rather than a victim of climate change. Octavia offers carbon dioxide removal (CDR) packages for individuals and organisations, including options for philanthropic contributions, carbon offsetting, and carbon trading through CDR credits.

Captured CO_2 is liquefied and transferred to partners for permanent geological storage, where it mineralises over time. The company's first commercial-scale plant, Project Hummingbird, targets 1,000 tonnes of CO_2 removal annually by 2026, with ambitions to exceed one million tonnes per year by 2030.

Process optimisation is critical to Octavia's success, requiring precise CO_2 measurements throughout the DAC cycle. "We need to accurately measure carbon dioxide levels from an ambient concentration of around 430 ppm all the way up to captured CO_2 at 99.99%," said Khamis Mwalwati Muniru, process optimisation lead at Octavia.

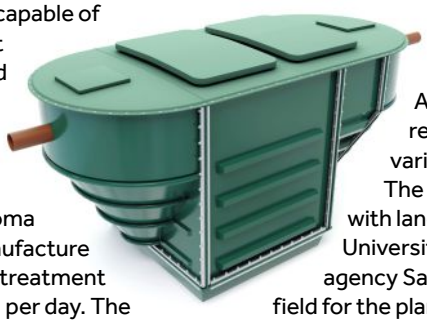
After testing multiple sensors, the team adopted Vaisala's GMP343 and MGP241 probes for their accuracy and stability across a wide range of concentrations.

Vaisala's CARBOCAP technology ensures long-term measurement reliability, which is essential for process efficiency and third-party verification of carbon removal. "Our mission is clear – to optimise DAC technology and scale its impact," Muniru added.

Zoo installs wastewater system

A crocodile conservation zoo in Oxfordshire has adopted a bespoke wastewater treatment solution to address drainage challenges and support its planned site expansion.

The zoo, home to more than 100 reptiles including 18 species of crocodiles and other rare reptiles such as Cambodia's critically endangered Siamese crocodile and the Komodo dragon, required a system capable of managing complex effluent flows from animal pools and visitor facilities.



Wastewater technology specialist WCS Environmental Engineering (WCSEE) partnered with Soma Services to design and manufacture a modular HiPAF packaged treatment plant with a capacity of 7m³ per day. The system was tailored to handle seasonal fluctuations and intermittent backwash flows from crocodile pools, which operate similarly to swimming pools.

Graham Hyde, sales director at Soma Services, said: "The HiPAF wastewater treatment plant is the ideal solution for the crocodile zoo, where the site is not connected to mains drainage and has unique and complex requirements."

Before installation, the zoo secured a discharge permit from the Environment Agency. The HiPAF system was engineered to meet strict consent levels: 20mg/l biological oxygen demand (BOD), 10mg/l ammoniacal nitrogen, and 30mg/l suspended solids. A balance tank was added to regulate flow and manage load variations.

The project involved collaboration with landowner Christ Church, University of Oxford, and property agency Savills to repurpose a nearby field for the plant. Construction was completed in June 2025 using a cut-and-fill technique to minimise visual impact.

Hyde added: "Working closely with all parties from initial enquiry to installation ensured the site's requirements for reptiles and visitors were met. It's been a fantastic collaboration."

Robot dog sniffs out whisky

A new trial in Scotland is assessing whether advanced robotics can help detect small but costly ethanol leaks in whisky maturation warehouses for the first time.

The National Manufacturing Institute Scotland (NMIS) is testing a robotic sensing system, developed at its Digital Process Manufacturing Centre (DPMC) in Irvine, using a Boston Dynamics Spot robot at the Bacardi-owned John Dewar & Sons maturation site near Glasgow. The work is supported by the Scotch Whisky Research Institute.

Engineers have created a 3D-printed arm to carry a sensor capable of measuring ethanol vapour levels as the robot travels along a set route inside the warehouse. Bacardi helped design the experiment and completed baseline testing before the trial began.

Although focused on whisky casks, the project aims to understand how autonomous inspection could be used across sectors such as chemicals and energy. The technology could support routine monitoring tasks that are currently carried out manually.

Ethanol evaporation is a normal part of whisky maturation, which requires casks to be stored for at least three years before the liquid can legally be called Scotch whisky. The resulting loss, known as the "angel's share", must be monitored both to minimise waste and ensure safety. Current inspection methods rely heavily on manual checks and visual observations,

which can be time consuming and inconsistent.

NMIS describes the project as an early-stage proof of concept rather than an operational tool. A future phase may involve embedding similar sensors directly into a robot instead of mounting them on an arm, which could improve reliability and performance.

Bacardi, a family-owned company, has operated five Scottish distilleries for more than 25 years and recently added three new maturation warehouses at its Poniel site, where the trials took place.

Angus Holmes, whisky category director at Bacardi, said: "Craftmanship and heritage remains at the heart of our production of DEWAR'S Blended Scotch whisky and our portfolio of single malts, but there is also great potential for innovation and technology to support the industry to become more efficient and data-driven."

Huhtamaki plant upgrades automation network

Huhtamaki's Franeker plant in the Netherlands, which produces over 11 million recycled paper egg cartons weekly, has upgraded its automation systems to enhance reliability and prepare for future demands.

The facility, operating 24/7 with highly automated lines, has transitioned from older serial network standards to CC-Link IE Field – an open industrial Ethernet technology offering gigabit bandwidth and advanced diagnostics. The upgrade, already implemented on production lines, has simplified maintenance, reduced troubleshooting time, and improved system flexibility. CC-Link IE Field will now serve as the site standard for future projects.

The Franeker engineering team manages both legacy equipment and in-house development. Having used Mitsubishi Electric hardware for decades, the site has gradually adopted iQ-R series PLCs alongside CC-Link IE Field.

"We try to avoid making constant changes," said Albert Bruining, electrical engineer at Huhtamaki. "We want systems that will still be working 10 years from now. When we do update our technology, it needs to offer clear, long-term benefits. That was the case with CC-Link IE Field."

The upgrade included PLCs, inverters, and HMIs on a legacy machine. Benefits such as improved fault diagnostics, flexible wiring, and simpler hardware configurations have made commissioning and long-term support easier.

Wago to develop compact demonstration unit

Wago, a company recognised for its electrical spring connection technology, has introduced a new demonstration unit to present its full range of interconnection and automation products in real-world conditions.

The German manufacturer collaborated with enclosure specialist Spelsberg to design a housing that highlights the breadth of Wago's offering while ensuring portability for customer visits and exhibitions. The enclosure also demonstrates how Wago's products integrate within industrial applications.

"When people hear the name Wago, they often think of electrical connections such as DIN rail-mounted terminal blocks," said Clare McCusker, national sales manager at Spelsberg UK.

"However, Wago also provides electronic interface products and automation technology, including signal conditioners, relays, voltage converters, I/O systems, controllers and HMIs."

The challenge was to educate customers about these capabilities while maintaining its reputation as a market leader in electrical interconnection. It targets OEMs, panel builders, switchgear manufacturers, distributors and wholesalers.

Parker Hannifin launches NX8M range

Parker Hannifin has introduced a high-voltage extension of its NX8M mobile motor series, designed to meet rising demand for electrified off-road and mobile machinery.

The new range supports battery voltages up to 800 VDC, delivers power of up to 99 kW, and operates at speeds reaching 8,000 rpm. Available in three sizes, the motors feature a 156 mm square frame compatible with SAE A, SAE B or ISO 3019/2 standards for direct pump mounting. Optional water or oil cooling and resolver feedback are included to ensure durability in harsh operating environments.

Developed for heavy-duty applications, the motors can be integrated into construction equipment, refuse trucks, electric boats, airport ground vehicles, truck cranes, actuators and electro-hydraulic pump systems. Multiple winding options allow optimisation for different vehicle architectures and battery voltages.

"Customers asked for a high-voltage version of our NX8 family so they could extend the motor's proven benefits to higher power vehicles," said Bruno Jouffrey, mobile market manager for Parker Hannifin's electric motion and pneumatic division. "The NX8M high-voltage range preserves the compactness, ease of mounting and reliability our customers expect, while delivering the power and efficiency required for modern electrified mobile platforms."

Parker also offers engineering support for system selection, cooling integration and inverter matching to ensure optimal performance and reliability.

Fanuc and NVIDIA forge new era

Fanuc and NVIDIA are integrating advanced artificial intelligence into industrial robotics, aiming to accelerate the adoption of physical AI across global manufacturing.

Fanuc will combine its industrial robots with NVIDIA's AI computing technologies, including the NVIDIA Jetson platform for on-robot processing and NVIDIA Isaac Sim for high-fidelity simulation. The company has also introduced support for the open-source robotics platform ROS 2, enabling Python-based programming to make AI-enhanced automation more accessible to developers, researchers and manufacturing businesses.

The collaboration will allow manufacturers to build digital twins of factories and robot fleets, using simulation to test, train and optimise systems before deploying physical equipment. NVIDIA's physics-aware AI tools are designed to ensure these virtual models closely reflect real-world performance, helping companies improve safety, reduce commissioning time and streamline automation planning.

Traditional industrial robots typically require manual reprogramming when production processes change, often leading to downtime. Fanuc and NVIDIA aim to address this by embedding real-time perception, voice interpretation and adaptive reasoning into robotic systems. These physical-AI capabilities are intended to help robots work safely alongside people, adjust to shifting environments and switch tasks more flexibly.

For UK manufacturers, the partnership could support greater agility as supply chains evolve and product cycles shorten. The use of open platforms such as ROS 2 is expected to encourage innovation within the sector, allowing companies to develop or customise AI-powered applications on top of Fanuc's hardware and NVIDIA's simulation ecosystem.

INMOCO presents servo drive and motor system

Kollmorgen has launched a new servo drive and motor system designed to simplify motion development for machine builders and reduce time to market across multiple industrial sectors.

Kollmorgen's new servo system, distributed in the UK by motion specialist Inmoco, pairs a matched drive and motor with integrated absolute multi-turn feedback and single-cable technology. The package is aimed at manufacturers seeking to streamline design, build and commissioning while maintaining reliable motion performance in applications ranging from robotics to warehouse automation.

The system offers three drive and motor current ratings — 3 A, 6 A and 12 A — with AC voltage options of 120 V and 240 V. Models rated at 400 V and 480 V are due for release in early 2026. Output capability spans 200 W to 4 kW, and an integrated 24 V DC brake is also available. To support easier system specification, the company has created a core product set that can be rapidly configured for different applications.

To help OEMs adapt to varying end-user requirements, the Kollmorgen essentials drive includes multi-protocol communication as standard. Supported fieldbuses include EtherCAT, EtherNet/IP and Profinet, while multi-axis synchronisation can be achieved via EtherCAT, CIP Sync or Profinet IRT.

Commissioning has been streamlined through a new graphical interface within Kollmorgen's WorkBench software. The Express Setup tool provides a step-by-step configuration process suitable for users with no previous motion-control experience, while advanced programming and tuning remain available through the full WorkBench suite for experienced engineers.

Westermo unveils Wi-Fi 7 access points for rail

Westermo has introduced two new Wi-Fi 7 access points for the rail sector, aiming to deliver faster, more secure and more reliable onboard connectivity services.

The company has launched the Ibex-1520 and Ibex-3520, two access points designed to support high-capacity and mission-critical communication in rail environments. Both models use the Wi-Fi 7 (802.11be) standard, with the Ibex-1520 providing dual-band operation on 2.4 GHz and 5 GHz, 2x2 MU-MIMO, multi-link operation and support for up to 512 clients per radio.

The Ibex-3520 adds tri-band capability by operating simultaneously on 2.4 GHz, 5 GHz and 6 GHz. It includes 2x2 MU-MIMO, multi-link operation up to 320 MHz and 4096-QAM modulation, offering higher capacity for crowded passenger services and data-intensive applications. Both devices feature Bluetooth 5.2 and GNSS for enhanced location tracking. The access points are certified to EN 50155 for electrical safety and EN 45545-2 for fire protection.

They are built to cope with shock, vibration, humidity and electromagnetic interference, incorporating a Gore-Tex membrane to reduce condensation and high-level isolation to guard against overvoltage and surges.

Their metal housing, IP66 protection rating, M12 connectors and operating range of –40°C to +70°C are intended to ensure durability in harsh onboard conditions. Security features include WPA2/WPA3, 802.1X with RadSec, persistent security logs and regular updates through the IbexOS operating system.

Westermo says the units are for remote maintenance, data offloading and integration with train control and management systems.

Burckhardt delivers turnkey LNG Solution

Burckhardt Compression has completed a turnkey compression project in a move that supports operations at LNG terminals in Nicaragua and the Bahamas.

The project was carried out for a manufacturer of cryogenic gas processing equipment and small-scale LNG and industrial gas plants.

The customer faced a time-critical challenge: delivering a compression system that could be installed quickly, operate reliably under cryogenic conditions, and fit within restricted terminal layouts. Key specifications included a skid-mounted design, compact footprint, fast delivery, and extensive testing to ensure operational integrity.

Rather than promoting its own Laby® compressor range, Burckhardt Compression evaluated multiple technologies and recommended an Other Brand Compressor (OBC) package as the best fit. The decision was based on a comprehensive assessment of budget, delivery timelines, installation complexity, performance expectations, and long-term serviceability.

The project involved close coordination between Burckhardt Compression's sales, contracting, and project management teams and the customer. Ultra-compact, single-skid compressor packages were delivered and installed on schedule, with full technical support throughout. A successful witness test confirmed system performance, reinforcing confidence in the solution.

Import and export terminals require equipment that is highly reliable, modular, and compliant with international safety and environmental standards. Burckhardt Compression's approach met these criteria, demonstrating its role as a strategic partner in technically demanding environments.

Siemens launches production optimisation solution

Siemens has introduced a new production optimisation solution aimed at small and medium-sized manufacturers in the United States, addressing critical challenges in the industrial sector.

With workforce shortages projected to leave 1.9 million jobs unfilled by 2032, according to Deloitte, and equipment failures causing up to 20% production losses, manufacturers face mounting pressure from rising costs, supply chain disruptions and the complexities of adopting Industry 4.0 technologies.

"Small- and medium-sized manufacturers are the backbone of our economy and they are dealing with a different set of

challenges compared to enterprise-scale manufacturers," said Chris Stevens, president of Siemens Digital Industries, U.S. "Among these are transparency to performance, workforce readiness, technology integration, cybersecurity, and productivity."

The new SMB Production Optimisation Starter Pack, part of the Siemens Xcelerator portfolio, offers an open digital business platform delivered as a service. It includes Siemens Industrial Edge Management Cloud and Industrial Edge Virtual Device, providing cybersecure tools that allow businesses to pay for what they need and scale at their own pace.

Siemens is offering a three-month free trial followed by an annual subscription, which includes technical support, self-paced training and access to Siemens' network of partners. Partners such as Prolim will provide local support, implementation assistance and tailored guidance.

ACCIDENT REPORT

A selection of recent plant-related investigations by the Health and Safety Executive

Two recent incidents were partly caused by a failure to adequately guard equipment and provide a risk assessment.

Firstly, Power and Energy International Ltd of Stanley Street, Salford, has been fined £187,600 after the shirt of an apprentice got caught in machinery.

Harry Pullen, who was 18 years old at the time, was pulled into a radial-arm drill resulting in three broken ribs and needing skin grafts.

He had been working as a machinist for Power and Energy International, manufacturing industrial valves and filters, for less than a year when the incident occurred on 10 July 2023.

The apprentice was still learning how to operate the different machines involved in manufacturing. He was left with a large piece of skin removed from his chest, hospitalised for five days and unable to work for six months.

An investigation by the Health and Safety Executive (HSE) found that Power and Energy International had failed to take appropriate measures to ensure the safety of their employees.

The company's radial-arm drills did not have adequate guarding. Machine operators, including Harry, had not been properly trained on using the safety features. The company was also found to have made modifications to the radial-arm drill which increased the risk of operators getting caught and pulled into the machine.

HSE guidance states employers must properly assess risks and take effective measures to prevent access to dangerous parts of machinery. This is normally achieved with fixed or adjustable guards but where this is not practicable other protective devices may be needed that stop the movement of dangerous parts.

Employers must also ensure that they provide their employees with the necessary level of information, instruction, training, and supervision to enable them to work safety with the equipment they use. Guidance on health and safety in engineering workshops can be found on the HSE website: Health and safety in engineering workshops – HSE (*www.tinyurl.com/mr3wn55p*).

Elsewhere, Matrod Frampton Limited, of Riverside Park, Wimborne, Dorset, has been fined £100,000 after a steel-fixer was seriously injured when a newly built blockwork wall collapsed at a site in Poole.

Matrod Frampton Limited pleaded guilty at Bristol Magistrates' Court on Friday 5 December 2025 after the incident left 69-year-old Patrick Grant with life-changing injuries.

The court heard how the breeze block wall had been back-filled too early, before the mortar had properly set. The wall collapsed while Mr Grant was working nearby, crushing him against the concrete floor of the excavation.

The incident happened on 19 August 2022 at the company's site on Old Coast Guard's Road, Poole. Grant and two colleagues had started work at the lower level of the excavation when the wall at the north end gave way at around 8.30am.

Emergency services attended the scene, but there was no emergency rescue plan in place. The use of an unstable ladder to access the deep excavation delayed rescue efforts, and Mr Grant had to be hoisted out by the fire and rescue service before being airlifted to hospital.

An investigation by the Health and Safety Executive (HSE) found that Matrod Frampton Limited had failed to properly assess a foreseeable risk associated with temporary works on site.

The investigation identified that there was no temporary works design for the blockwork wall, nor for any other temporary work structures at the site.

The company had failed to appoint either a temporary works coordinator or a temporary works supervisor, despite this being highlighted as a serious concern in a safety report issued eight

days before the incident.

Temporary works on construction sites include trenches, excavations, temporary slopes and stockpiles, formwork, falsework, propping, shoring, edge protection, scaffolding, site fencing and signage.

Without a temporary works procedure in place, groundworkers backfilled the wall prematurely, leading directly to its collapse.

Guidance on temporary works is available on the HSE website *(www.tinyurl.com/2mxbrsn2)*.

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