Issue 1 2026

INDUSTRIAL NEWS

MODERN THREATS

WHEN A CYBER ATTACK BECOMES BUSINESS RISK

ALSO IN THIS ISSUE

MODERNISATION: THE INDUSTRIAL OPPORTUNITIES OF VIETNAM

ASSET MONITORING: UNLOCKING THE FACTORY FLOOR





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THE MODERN FACTORY

This issue is about what industrial modernisation looks like once it reaches day-to-day operations, moving beyond the confines of planning meetings and proof-of-concept projects.

We often still think of modernisation as being synonymous with digitalisation, but as this edition shows, it's really about control: knowing what is happening across sites, systems, and assets, and being able to act before problems turn into lost output, higher costs, or compliance failures. That question appears in different forms throughout the magazine — in building safety and the demands of documented accountability, in food safety and persistent audit gaps, in predictive maintenance, in asset monitoring, and in the pressure on industrial businesses from energy costs and grid change.

There is also a clear commercial point running through these pages. Much of the current discussion around industry is dominated by AI, digital twins, automation, and software-led systems. Some of that is justified. But technology on its own solves very little. The practical issue is whether companies can integrate it properly, trust the data behind it, and use it to make better operating decisions.

That is particularly relevant at a time when margins are tight, infrastructure is under strain, and management teams are being asked to deliver more resilience with less room for error. In that context, the businesses that move forward will not necessarily be the most vocal about innovation. More often, they will be the ones with better visibility, stronger engineering discipline, and a clearer understanding of where operational risk actually sits.

Welcome to the first Industrial News magazine of 2026.

— Jon Hughes, Editor





INDUSTRY

GE AEROSPACE EXPANDS EUROPEAN MANUFACTURING

GE Aerospace will invest more than €110 million across its European manufacturing sites in 2026, with a further €40 million earmarked for MRO and component repair facilities, as it looks to raise production capacity, expand advanced manufacturing, and improve delivery performance.

The programme spans Italy, Poland, the Czech Republic, the UK, and Romania. Italy will receive the largest share, at €77 million, for test cells, machining equipment, additive manufacturing, and site upgrades supporting commercial and defence engine programmes. Poland will receive €15 million, the UK €10 million, the Czech Republic €8 million, and Romania €3 million for new machining, inspection, welding, electronics, and infrastructure upgrades.

Alongside the capital spend, GE Aerospace plans to hire more than 1,000 workers across Europe this year and expand training initiatives aimed at easing the region's high-tech skills shortage. Support includes vocational training grants in the UK and Italy, reaching more than 800 students in 2026, and an expanded Next Engineers programme in Warsaw set to reach more than 4,000 students.

Europe remains GE Aerospace's largest footprint outside the US, with operations in 18 countries and around 13,000 employees.

UK AVIATION SETS OUT JET ZERO PROGRESS

At the Sustainable Skies World Summit in mid-March, the UK Government and aviation industry outlined progress on decarbonising air travel, with aviation minister Keir Mather launching the Jet Zero Taskforce's first annual report.

The report said 2025 marked a shift from strategy to delivery, with the UK's Sustainable Aviation Fuel mandate introduced in January requiring suppliers to blend SAF from 2%, rising to 10% by 2030. Ministers also advanced the proposed Revenue Certainty Mechanism to support private investment and allocated £63 million through the Advanced Fuels Fund.

Industry activity over the past year has included new SAF supply agreements, production projects, and partnerships such as Project Speedbird. Work on zero-emission flight also moved forward through the Hydrogen Challenge programme and almost £240 million in joint backing for next-generation aerospace technologies. Operational measures, including the new UK Airspace Design Service and more efficient aircraft spacing, were also cited as early sources of emissions savings.

Alongside the report, Sustainable Aviation announced a £2 million Advanced Market Signal initiative to stimulate the greenhouse gas removals market. The sector estimates aviation will require 20–30 million tonnes of removals annually by 2050, while also increasing work on non-CO_2 impacts such as contrails.



UK INDUSTRY RISKS FALLING BEHIND IN AI-DRIVEN MANUFACTURING AS CHINA ACCELERATES



China is setting the pace for the factory of the future, while Europe — and particularly the DACH region of Germany, Austria, and Switzerland — remains constrained by legacy IT, fragmented OT environments, and poor data integration. The UK is also slipping behind. Those are the central findings of the Industry 4.0 Barometer 2026, published by consultancy MHP with Prof Dr Johann Kranz of LMU Munich.

Based on a survey of more than 1,200 industrial decision-makers across the DACH region, the UK, the US, China, India, and Mexico, the report tracks adoption of technologies including digital twins, AI, supply chain transparency, and Software-Defined Manufacturing (SDM).

Globally, the measured degree of industrial digitalisation has risen from 48% in 2022 to 66% in 2026. China now stands at 72%, the US at 69%, India at 68%, and Mexico at 67%. By contrast, the UK has slipped two points to 62%, while DACH remains stuck at 57%.

The main barriers are familiar, but still unresolved: legacy systems, data silos, and limited interoperability. In the UK alone, 47% of respondents cited old IT systems as an obstacle, while 40% pointed to fragmented data structures.

Digital twin adoption is advancing faster than any other technology tracked by the study. Use in plants and machinery rose from 54% to 62%, while logistics applications climbed from 61% to 67%. China again leads, with 84% of companies reporting at least partial use of digital twins in logistics, ahead of Mexico on 74%, India on 68%, the US on 61%, the UK on 54%, and DACH on 42%.

AI tells a similar story. In production environments, 71% of Chinese companies report at least partial use, followed by India on 61%, the US on 57%, Mexico on 51%, the UK on 48%, and DACH on 37%. Yet the report argues that much of Europe's AI activity remains confined to pilots, without the sensor, data, and digital twin foundations needed to turn it into a genuine productivity lever.

The clearest warning may be around SDM, where China and India both report 30% of respondents with a very high level of familiarity, compared with 18% in Mexico, 14% in the US, 6% in the UK, and just 3% in DACH. On MHP's reading, software-led manufacturing is fast becoming a test of industrial competitiveness — and Europe is still treating it like a future problem.

IMI TO SUPPLY SPECIALIST VALVES FOR NORTH SEA OFFSHORE

IMI has been selected to supply specialist control valves for ultra-high-pressure injection systems supporting a major offshore development in the North Sea.

The valves will operate under extreme conditions where pressures exceed 600 bar (8,700 psi) supporting chemical injection processes that help maintain flow and optimise production from deep offshore wells.

IMI will provide its EroSolve Metamorphic Trim (MMT) valve range, engineered to deliver precise and stable pressure control under severe service conditions. The valves are designed to manage full pressure drops from 621 bar (9007 psi) to near vacuum conditions while maintaining accurate low flow regulation; a level of performance required for safe and reliable offshore operations.

The valves incorporate a multi-stage pressure reduction design, enabling controlled energy dissipation across the trim and protecting internal components from excessive wear.

The supply follows the successful completion of a rigorous endurance testing programme, where both balanced and unbalanced valve configurations were subject to operating conditions representative of field life.

Roby Buyung, President for Process Automation at IMI, said: “Offshore production environments continue to push engineering boundaries, particularly as developments move into deeper, higher-pressure fields.

“The project required valve technology capable of delivering extremely precise pressure control under conditions that would challenge most conventional designs.

“Our EroSolve Metamorphic Trim valves are engineered specifically for these severe service applications and this selection reflects the importance of proven, repeatable performance in safety-critical offshore systems.”

The project forms part of a wider offshore development programme and is now progressing in line with the customer’s delivery schedule.



KISTLER TARGETS E-POWERTRAIN TESTING DEMANDS



Kistler has announced KiBox2 E-Powertrain Analysis, a modular measurement and analysis platform designed to support development, testing, benchmarking, and validation of electric, hybrid, and fuel-cell powertrains.

Aimed at automotive R&D teams, the system delivers real-time power analysis, rapid calculation windows for dynamic test procedures, and scalable configuration with up to 64 measuring channels. It can be used across laboratory, dyno, and on-track environments, covering components including inverters, e-motors, power electronics, resolvers, and full drive assemblies.

The platform combines a 16-channel measuring unit with high-voltage and high-current modules, supporting measurements up to ±1000 Vrms / ±1500 Vpeak and current ranges of up to 2000 A. Kistler said the system also supports simultaneous analysis of electric and combustion-based drivetrains, including mechanical power data such as torque and speed.

Data is stored in ASAM-compatible .mdf format and can be further processed through Kistler's Cockpit and jBEAM Powertrain software for advanced offline engineering analysis.

AVEVA AND NVIDIA BRING DIGITAL TWIN TOOLS TO AI FACTORIES

AVEVA has announced a collaboration with NVIDIA to integrate its engineering and operations software into the NVIDIA Omniverse DSX Blueprint, creating a lifecycle digital twin architecture for large-scale AI factories.

The companies said the system is designed to speed the design, deployment, and optimisation of gigawatt-scale AI infrastructure by combining AVEVA's industrial software with NVIDIA's simulation and visualisation environment. The integration spans engineering design, asset information management, process simulation for advanced liquid-cooling networks, and operational monitoring across electrical, mechanical, and safety systems.

AVEVA said customers would be able to bring OpenUSD SimReady assets into its Unified Engineering environment, reuse existing data, and manage equipment and system information through a single digital thread from design into operations. Its PI System will also aggregate IT and OT telemetry across the platform for real-time analysis, with future development expected to incorporate NVIDIA's NV-Tesseract model for anomaly detection and forecasting.

The wider collaboration also includes Schneider Electric and ETAP, with the partners targeting faster deployment, improved cooling efficiency, stronger operational visibility, and better GPU utilisation as AI infrastructure scales. AVEVA also said its operations software would support unified oversight of power, cooling, UPS, switchgear, chillers, and other critical systems in high-density facilities.

ELECTRONICS

MOLEX LAUNCHES CO-PACKAGED COPPER FOR 224G DATA RATES

Molex has launched its Impress Co-Packaged Copper Solutions, a new near-ASIC interconnect platform designed to support next-generation data centres and AI workloads with data rates of 224Gbps PAM-4 and beyond.

The system combines a compression-based on-substrate connector with a mating cable assembly, allowing the connection point to sit directly on the ASIC package substrate. Molex said this reduces the distance signals must travel through the PCB, helping to improve signal integrity, cut crosstalk, and support more efficient power distribution in high-density architectures.

Impress builds on the company's NearStack On-the-Substrate platform, with Molex saying more than one million units have already been delivered. The new design is intended to simplify scaling and upgrades in data centre systems, with a compression-attached socket aimed at reducing damage to the substrate while making rework and maintenance easier.

The company added that the product is engineered for rugged operation, with strain relief and contact-wipe features intended to improve durability over repeated mating cycles.

Impress is available now for applications up to 224Gbps PAM-4, while validation work is already under way for future 336G and 448G deployments as networking moves from 1.6T to 3.2T speeds.

BYTESNAP AND DIGI TARGET EMBEDDED LINUX SECURITY

ByteSnap Design has partnered with Digi International to launch a Premium Software Security Service aimed at helping manufacturers manage embedded Linux security across long device lifecycles.

The service combines Digi's vulnerability intelligence and patch distribution infrastructure with ByteSnap's integration and validation expertise, offering a managed approach intended to reduce the need for manufacturers to coordinate multiple security tools, vendors, and support models. It is designed for both Digi-based platforms and mixed hardware estates.

The partners said the service addresses a growing challenge for connected product manufacturers as vulnerability volumes rise, operational lifecycles lengthen, and regulatory expectations shift towards continuous post-deployment security management. Rather than issuing broad alerts, the system is intended to identify only the vulnerabilities relevant to a customer's deployed configuration, cutting unnecessary update noise and focusing attention on genuine risks.

ByteSnap said the service also provides automated documentation, monthly reporting, verified patch histories, and support for platform migration where legacy devices require OS upgrades. Updates are validated in deployment-like conditions before release, reflecting the fact that embedded Linux devices often run unattended for years, where poorly tested patches can be as disruptive as the vulnerabilities they are meant to address.

FOOD PROCESSING

ALFA LAVAL LAUNCHES ENSALINE AGITATOR

Alfa Laval has launched its new EnSaLine agitator platform, targeting hygienic production sectors including food, dairy, beverages, pharmaceuticals, and home and personal care with a design focused on lower energy use, faster servicing, and future-ready connectivity.

The company said the new range is intended to address longstanding problems in hygienic mixing, where agitators are often energy-intensive and maintenance-heavy. A central feature is Alfa Laval's EnSaFoil impeller technology, which the company claims can cut mixing time and reduce energy consumption by up to 80%, helping deliver payback in less than two years.

Maintenance has also been redesigned to reduce time, labour, and safety risks. Alfa Laval said EnSaLine units can be serviced by a single technician in under 30 minutes, without requiring tank entry. Seals and bearings are housed in a replaceable cartridge, while the shaft seal assembly is designed to reduce complexity and limit spare parts requirements.

The range also includes sensor-based connectivity for predictive maintenance, allowing operators to monitor condition, optimise service intervals, and reduce unplanned downtime. Alfa Laval said the platform has been designed for simplified configuration, faster installation, and lower operating costs, with side-mounted and bottom-mounted versions now available.

AUTOPACK DELIVERS AUTOMATED SAUCE LINE FOR P&B FOODS

Autopack has supplied P&B Foods with a bespoke automated packaging line for sauces, integrating five machines to streamline production across a range of plastic and glass containers from 250ml to 1 litre.

Designed for high-throughput sauce filling, the line can run at up to 100 containers per minute on one-litre bottles. It includes a high-speed rotary unscrambler feeding into a 12-head alternating piston filler suitable for both hot and cold fill applications. Sealing is handled by a four-head automatic plastic screw capper and an MC100 metal capping machine, allowing the line to manage both plastic and metal closures. A multifunctional labeller provides front, wraparound, and tamper-evident labelling at the end of the line.

P&B Foods said Autopack's experience in sauces, edible oils, and other viscous products was a key factor in the award, alongside its ability to provide layout planning, design support, and full line integration from concept through commissioning.

The success of the installation has led to further work between the companies. Additional automation projects now in manufacture include can and glass lines for ghee products, as well as a fully integrated drum filling line for edible oils. Autopack said the project reflects continued demand for turnkey food packaging automation that improves speed, efficiency, and waste reduction.



POWER

SALKO UK SECURES FOUR-YEAR UNIPER MAINTENANCE DEAL



Salko UK has been awarded a four-year framework covering maintenance works at Uniper's Enfield, Grain, and Taylors Lane power stations, including a major contract for Once-Through Cooler (OTC) and gas turbine exhaust works at Enfield Power Station in Brimsdown, London.

At Enfield, the company will carry out a high-priority tube bundle replacement designed to improve the thermal performance, mechanical integrity, and reliability of the station's high-pressure cooling system. The work includes removal of existing components, fabrication, installation, inspection, testing, and commissioning. Salko will also continue maintenance of the GT exhaust system to support longer equipment life.

The programme is intended to reduce forced outage risk, improve start reliability, enhance plant availability, and strengthen on-site safety.

Over the next four years, the framework will include ten planned projects and marks the company's second agreement of this kind with Uniper. The work also supports the wider turbine modernisation programme at Grain Power Station, being carried out with GE Vernova on three GT26 gas turbines, following earlier upgrades at Enfield that improved output, efficiency, fuel use, and maintenance intervals.

TERNA APPROVES GRID LINK FOR 3GWH ITALIAN BESS PROJECT

Airengy has secured grid connection approval from Terna for a battery energy storage project in Brindisi, southern Italy, clearing a key development hurdle for one of the country's largest planned BESS schemes.

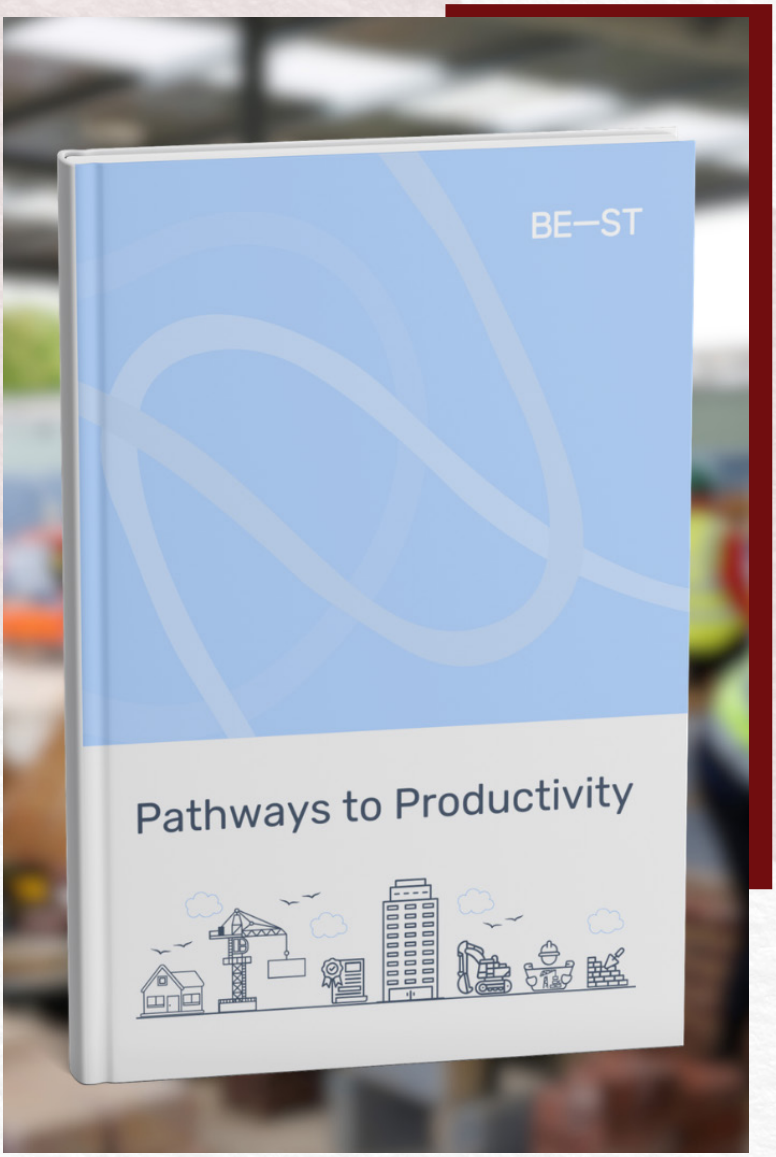
The lithium-ion project is designed for storage capacity of up to 3GWh, with a grid connection capacity of 509.25MW and a planned discharge duration of four to eight hours. Terna confirmed the connection point at the Pignicelle substation, less than 3km from the site. Airengy said construction is expected to take around 20 months from signing the connection agreement.

The company expects to invest about €230 million in the project, with projected annual revenues of €35 million to €50 million. Developed through a 50:50 partnership with 7B of the Yehuda Levi Group, the facility is intended to support Italian grid stability and enable greater renewable energy integration.

Airengy said the approval allows the project to move into the next stages of engineering, licensing, and regulatory submission, including documentation for Italy's Ministry of the Environment and Energy Security. The project forms part of the company's broader European storage expansion strategy, which also includes a recently announced acquisition of six solar project companies in Poland with a combined capacity of around 34MW.

CONSTRUCTION

REPORT SETS OUT ROUTE TO STRENGTHEN SCOTLAND'S CONSTRUCTION WORKFORCE



A new report has set out how Scotland could improve the flow of new entrants into construction and the built environment, as the sector faces persistent skills shortages alongside rising demand linked to housing, infrastructure, and net zero delivery.

Pathways to Productivity, commissioned by **Skills Development Scotland** on behalf of the Skills and Workforce Group of the Construction Accord and delivered by BE-ST, examined how employers, training providers, representative bodies, and public partners can better attract, recruit, train, and retain the next generation of workers. The research was informed by engagement across Scotland with employers, education providers, industry bodies, and public sector organisations.

The report argued that construction remains central to Scotland's economic, environmental, and social priorities, from delivering homes and hospitals to upgrading infrastructure and supporting decarbonisation. Forecasts suggest the sector's workforce could reach around 214,500 by 2029. Yet with the Construction Industry Training Board estimating that roughly 8% of the workforce must be replaced each year through natural attrition, improving workforce entry routes remains a pressing issue.

At the same time, the report noted that the sector's skills needs are changing. Greater use of digital tools, modern methods of construction, and tougher performance standards is increasing demand for new capabilities, creating pressure not only to bring more people into the industry, but to ensure they are trained for a more modern built environment.

The study identified six shared measures of success: workforce capacity, competence, employer confidence, sector culture, workforce composition, and long-term continuity in workforce planning. Its central message was that progress will depend on closer collaboration across the wider construction skills ecosystem, so that entry pathways are more accessible, flexible, and aligned with future demand.

The findings form part of wider work under the Construction Leadership Forum's Skills and Workforce Mission, aimed at improving long-term resilience across Scotland's construction sector.



HOW MODERN METHODS OF CONSTRUCTION WEAVE THE GOLDEN THREAD

By Steve Chesters, Business Unit Director, HadleyFRAME

In 2018, the Hackitt Review detailed the failing regulatory system for high-rise and complex buildings, with the then current system being not fit for purpose. Now, in 2025, steps have been taken to create a new regulatory framework focused on multi-occupancy higher-risk residential buildings (HRRBs).

This includes the golden thread, a digital record of information about the building that complies with legal duties and helps to manage building safety. It contains relevant health and safety information, original plans and drawings for a building, proof of regulations compliance and a completion certificate from the Building Safety Regulator (BSR) that states the building complies with regulations and is being properly managed and maintained so that it is suitable for living.

Traditionally, health and safety risk registers would have often sat disconnected from the digital information held for the completed asset, but now, there is a shared onus of accountability.

This is monumental for the industry and ushers in a new era of additional responsibility for senior leaders, with regulatory compliance becoming both a legal and moral duty for those to in charge to ensure safety and peace of mind.

It also provides a better working collaboration, or 'thread', between the multiple stakeholders involved in an assets life cycle and encourages agile ways of working that create a common approach among all parties.

HIGH RISE BUILDINGS HELPING TO MEET TARGETS

The raising standard of building safety in the UK comes at a time where the government's promise to match ambitious targets is at a crossroads.

The current aim is for 370,000 new homes to be built in England every year, to fulfil a government promise for 1.5m new homes within the next five years, however Steve Reed, Secretary of State for Housing, Communities and Local Government, has admitted a sharp surge is needed to meet these promises. High-rise buildings are already a contested solution to the housing crisis, despite being seen as an efficient use of land in congested towns and cities.

Over the past seven years since the landmark review, the construction industry has struggled to come to a unified decision about the best process for the safety of HHRBs. Traditional building methods for these types of projects can be complicated, costly, and time consuming, making it even more difficult to keep track of that



all-important golden thread.

But businesses which are ahead of the curve and integrating modern methods of construction (MMC) could play a huge role in helping to weave the golden thread and ensure the country stays on track.

THE CHANGING METHODS OF CONSTRUCTION

Industrialised and off-site construction techniques, such as mass production and factory assembly, already provide a full-service solution. From idea conception to delivery, with internationally recognised production standards that mean contractors and building management can have that digital record needed to comply with regulations.

This method also optimises the supply chain, as everything is designed and manufactured in-house and ensures full product traceability, so there is complete oversight of where the materials are coming from.

Plus, it's a streamlined system, so you're not in contact with multiple trades and can have a clear line of communication, making the required golden thread of digital records easier to collate. As well as the commercial advantage of no compounding of margin.

Simply put, this is the future for the construction industry, and the new regulations only support the idea that high rise buildings can be built more safely under these methods.

HOW THE BUILDING SAFETY ACT CHANGED THE TIDE

The Building Safety Act has moved the sector from talking about building safety to having to evidence it. The golden thread expects accurate, digital information that runs from early design through manufacture, installation and operation. That is far easier to deliver when the supply chain is integrated, repeatable and working off a single, documented and traceable, stream of information.

Overhauling the previous existing regulations also created a lasting change by making clear how residential buildings should be constructed, maintained and made safe.

MMC around residential buildings, particularly offsite steel frame systems, offer a peace of mind and factory controlled quality that many may see as previously lacking.





THE FUTURE

Yes, it's true that there will be growing pains and initial learning as with the introduction of any new procedures, but, looking to the future of building safety and modern methods of construction, it's clear that they will be working hand in hand to deliver safer structures and better buildings.

To achieve the housing targets, we need a system that speeds up the construction process without compromising on safety but also considers many of the other struggles the construction industry is facing like net-zero targets, increased landfill taxes and a decrease in eligible brownfield sites for building. This new system needs to utilise MMC, and specifically offsite construction techniques, like the HadleyFRAME steel framing solution, to be able to achieve a safer built Britain.

RETHINKING PERFORMANCE-BASED DESIGN

By Luis Suarez, Business Development Manager,
Ramtech North America

As construction across the United States accelerates, projects are growing larger, faster and more complex, raising the stakes for fire safety. Yet traditional performance-based design often overlooks the construction phase, leaving sites exposed during one of the riskiest stages.

Performance-based design (PBD) is often associated with demonstrating compliance for finished buildings, using engineering models to show that fire and life-safety requirements are met. In practice, PBD sets measurable performance objectives – such as maximum temperature rise, structural resilience or evacuation times – and allows flexibility in how these targets are achieved.

Yet construction-phase risks are frequently overlooked. Temporary materials, hot works and site logistics create fire hazards that differ from the completed building. Applying PBD during construction means establishing stage-specific performance targets, monitoring them in real time and adjusting mitigation strategies dynamically.

For example, temporary fire detection coverage can be evaluated using PBD principles – defining response times for alarms, coverage zones for sensors and suppression capacity relative to combustible materials on site. By quantifying these parameters, project teams can make design decisions that minimise risk while remaining practical and cost-effective.

A PATCHWORK OF STANDARDS

In Europe, temporary fire protection during construction is widely embedded in safety planning, with performance targets verified through engineering analysis. In the US, adoption is inconsistent. Regulations and enforcement vary between states and municipalities, creating a patchwork of compliance requirements under the NFPA and International Fire Code.

States such as California, Massachusetts and New York have adopted more progressive approaches, often informed by previous disasters or regional fire risks including wildfires. On some projects, this has translated into clearer expectations for temporary fire detection during construction. For example, the development of 20 CambridgeSide Tower in Massachusetts included provision for a temporary wireless fire alarm system to maintain life safety protection while permanent systems were still being installed, with systems such as Ramtech's WES3 referenced within the project specification.

In contrast, other states have been slower to implement temporary fire measures, presenting challenges for nationwide projects.

PBD can help bridge this inconsistency by providing a performance-based rationale for safety measures rather than relying solely



on prescriptive rules. Engineers can model construction-stage risks, propose mitigation systems and demonstrate compliance with measurable outcomes, supporting decision-making across jurisdictions.

THE REAL-WORLD COST OF INACTION

Construction-phase fires can escalate rapidly. In wood-frame developments, even minor incidents – hot works, cooking or discarded cigarettes – can trigger catastrophic events. A 2023 fire in Charlotte highlights this risk. Without temporary fire protection, two workers lost their lives and damages exceeded $62 million. A performance-based approach to construction-phase fire safety, applied from the outset, could have prevented the escalation, protecting lives and minimising property loss.

Temporary systems informed by PBD also do more than protect property. On a New York project, a worker suffered a heart attack. Thanks to a monitored alarm system, responders were able to locate and treat him quickly, and he made a full recovery. By setting stage-specific performance targets, the PBD plan ensured that response times and coverage were sufficient to safeguard life – not just from fire, but from other emergencies on site.

OVERCOMING RESISTANCE

Modern construction-phase PBD is increasingly supported by connected and data-driven systems. Real-time monitoring provides insights into fire risk, alerting teams to potential hazards before they escalate and enabling resource allocation based on measured performance rather than assumptions.

Despite this, some project teams remain resistant. Traditional approaches such as manual fire watches or air horns are still used because temporary fire risk is underestimated until a serious incident occurs. Education on the benefits, adaptability and relatively low cost of wireless temporary alarm systems is crucial to drive adoption.

DRIVING CHANGE WITH PERFORMANCE-BASED THINKING

New developments in the US, including revised NFPA codes for fire safety, are expected in 2027, providing an opportunity to embed construction-phase PBD into standard practice. Artificial intelligence and analytics will increasingly support performance monitoring, allowing teams to evaluate metrics such as detection coverage, response times and suppression efficiency in real time.

For construction teams, the takeaway is clear: safety should be designed in from day one, not retrofitted after incidents. Applying PBD principles during construction ensures measurable fire performance, protects workers, preserves assets and allows engineers to make informed design adjustments before completion.

Ultimately, performance-based design is not just about meeting codes. It is about engineering fire safety into the process – from foundation to finish – ensuring safer sites and more resilient buildings.

THE INDUSTRIAL OPPORTUNITIES OF VIETNAM

*By Thao Pham, Vietnam Country Manager, **Intralink***

Over the past 20 years, Vietnam has become one of Southeast Asia's most important manufacturing hubs. But Vietnamese manufacturers are under increasing pressure to deliver higher productivity, tighter quality control and greater consistency, while coping with rising labour costs and skills shortages.

Sustaining competitiveness now depends less on low-cost labour than on smarter, more efficient production systems.

As a result, demand for industrial automation is accelerating. And this is presenting great opportunities for providers of automation technologies and services across the world.

Vietnam's industrial expansion has been driven by electronics, machinery, automotive components, textiles, food processing and logistics.

At the same time, the economics of production are changing. Wages have risen by 8% a year, labour turnover ranges between 24% and 30% and factories face growing difficulties in recruiting skilled technicians.

Against this backdrop, automation is now seen as a strategic investment that enables manufacturers to stabilise output, improve yields, reduce dependence on scarce labour and meet increasingly demanding international standards.

Robotics, machine vision, advanced control systems, manufacturing execution systems (MES) and industrial internet of things (IIoT) platforms are helping Vietnamese factories to reduce downtime, improve quality consistency and gain real-time visibility over operations. And such automation uptake is gaining momentum across a broad range of sectors.

Electronics manufacturers, including semiconductor assembly and consumer electronics producers like Samsung, LG, Amkor and Pegatron, are investing heavily in robotics, inspection systems and data-driven quality control.

Automotive and industrial components suppliers are following a similar path, driven by OEM requirements for consistency and traceability.



Food and beverage processors such as Vinamilk are adopting automation to improve hygiene, reduce waste and meet export certification standards. And logistics and warehousing operators like Viettel Post are deploying automated handling and tracking systems to cope with rising volumes and tighter delivery expectations.

THE NEED FOR OVERSEAS EXPERTISE

To meet this growing need, most technologies need to be imported from overseas, and this is presenting major opportunities for specialists from around the world to sell innovations spanning hardware, software and services.

Advanced robotics, high-precision motion control, sophisticated machine vision, data integration platforms, cybersecurity and full smart-factory architectures are areas where Vietnam's home-grown solutions are limited.

There's strong demand for sensors, MES, IIoT and analytics platforms, system architecture and integration knowhow, plus training programmes to build local operational capability.

International firms can also add great value through lifecycle services including maintenance strategies, upgrades and performance optimisation.

Equally significant is the shortage of experience in Vietnam in designing automation systems that scale across multiple sites or integrate seamlessly with multinational customers' global production and quality systems.

And demand is perhaps highest of all for advanced technologies that help manufacturers move from isolated automation projects to integrated, scalable production systems.

These are areas where international firms have a strong role to play, particularly those offering not just equipment but system design, software, analytics and long-term lifecycle support.

NAVIGATING MARKET COMPLEXITIES

At the same time, Vietnam is a complex market. Purchasing decisions are often decentralised, technical specifications



vary widely between factories and price sensitivity is high.

Factories are cautious about adopting unfamiliar technologies without clear evidence of performance and reliability. Regulatory requirements, localisation expectations and the need for on-the-ground technical support add further complexities.

All this means successful market entry typically involves collaboration with established Vietnamese players.

Common models include working with distributors or system integrators, partnering on projects led by multinational manufacturers, and developing longer-term service relationships with large Vietnamese industrial groups.

These challenges underline the importance of a structured market entry and expansion strategy.

And working with specialist advisors who understand the industrial landscape, have established relationships with buyers and can bridge cultural and technical gaps is often critical to success. For many overseas firms, such support turns theoretical opportunity into sustainable commercial traction.

A MARKET THAT REWARDS PREPARATION

So, Vietnam's manufacturing sector is evolving fast. The demand for automation is significant, growing and increasingly sophisticated, driven by long-term structural shifts rather than short-term cycles.

And success depends on a carefully considered strategy and plenty of determination.

Companies which approach Vietnam with a clear value proposition, a collaborative mindset and strong in-country support will be well positioned to participate in the nation's next manufacturing leap and embed themselves in one of Southeast Asia's most dynamic industrial markets.



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WHEN A CYBER ATTACK BECOMES A BUSINESS CRISIS

By Asdrúbal Pichardo, CEO, ***SQUALIFY***

When Jaguar Land Rover was forced to halt production following a cyberattack last year, the impact was immediate. Production lines across multiple global sites fell silent, thousands of workers across the supply chain were left in limbo, and the company's quarterly sales dropped by 24%. For six weeks, the disruption continued, costing the automaker an estimated £50 million per week.

The incident quickly became a stark reminder of how deeply cybersecurity is tied to business operations. With 43% of British businesses suffering from a cyberattack in the last year, Jaguar Land Rover is only the most prominent in a long list of cases. As manufacturers accelerate their adoption of automation, connected systems, and AI-driven processes, the attack surface grows not linearly, but exponentially. The question for business leaders is no longer whether an attack will be attempted, but which exposure matters most, and what it would actually cost.

The financial exposure from a serious cyber incident typically falls into three categories: business interruption, data privacy breach, and financial theft or fraud. In practice, many incidents combine all three. A ransomware attack, for instance, will typically trigger both operational disruption and a data breach simultaneously, with costs cascading across recovery, legal liability, and lost revenue.

Even businesses with mature cybersecurity programmes struggle to connect these scenarios to concrete financial figures. That gap matters, because without a financial lens, it is almost impossible to make rational decisions about where to invest in security, how much cover to carry, or how to explain cyber exposure to a board that thinks in profit and loss terms rather than threat matrices.

Regulatory pressure adds a further dimension. Under GDPR, organisations face fines of up to £17.5 million, or 4% of annual global turnover for inadequate data protection. Critically, parent companies can be held accountable for failures in their subsidiaries, meaning a breach at one entity within a group can carry consequences for the whole.

Yet despite these stakes, PwC data shows that only 15% of business executives measure the financial impact of cyber risks in any meaningful way. For the vast majority, investment decisions are being made without a clear picture of what is actually at risk.



FIRST MEASURE, THEN MANAGE

The shift that is needed is not primarily a technical one. It is a strategic one: moving from a vulnerability mindset, focused on closing individual security gaps, to a risk management mindset that asks what the business stands to lose and where investment will have the greatest effect.

In practice, this means quantifying cyber risk in financial terms before making decisions about where to spend. Rather than working upward from individual systems and vulnerabilities, leading organisations are starting from the top: modelling the financial consequences of plausible scenarios such as a major operational outage, a data breach, or a ransomware event, and using those figures to guide investment priorities and board-level conversations.

This is a shift we have seen play out directly in our work with manufacturers. Jungheinrich, one of the world's leading producers of material handling equipment, took this approach as part of a broader push to align its cybersecurity programme with its strategic goal of increasing automation. Working with Deloitte and the Squalify cyber risk quantification platform, the company modelled its financial exposure across key consequence scenarios and used the results to build a clear case for its executive board. As Dr. Tim Sattler, CISO at Jungheinrich, put it: "Now, I can have a straightforward dialogue with the right business language and confirm the strategic direction of our Cybersecurity program."

The lesson is not that every organisation needs the same solution. It is that security decisions made without a financial frame are, at best, educated guesses. Embedding cyber risk within an organisation's broader understanding of risk appetite, and measuring it in the same terms the board uses to evaluate every other business decision, is what transforms cybersecurity from a cost centre into a manageable, communicable, and governable part of running a modern industrial business.

AGENTIC AI TRANSFORMS ENTERPRISE ASSET MANAGEMENT



By Berend Booms,
Head of Enterprise Asset Management Insights
Ultimo



Industrial operations face an unprecedented crisis that threatens operational continuity across global markets. According to our Maintenance Trend Report, 63 percent of organisations consider the ageing workforce as their most pressing maintenance challenge. Half (50 percent) are struggling to recruit experienced staff. The foundation of industrial expertise is rapidly eroding. This skills shortage directly impacts what matters most in asset management: operational uptime. Even the briefest disruption has expensive consequences, and with millions in lost productivity and safety incidents looming, the stakes are high.

Part of the answer lies in agentic artificial intelligence (AI) - autonomous digital workers that don't just respond to commands but proactively optimise operations around the clock. Unlike traditional AI tools that require constant human oversight, agentic AI in Enterprise Asset Management (EAM) represents a fundamental shift toward autonomous systems that function as specialised experts, learning from every interaction and taking initiative to prevent breakdowns before they happen.

The magnitude of workforce challenges in industrial maintenance cannot be overstated. Our industry research reveals that almost half (49 percent) of industrial businesses lack the internal expertise required to adopt advanced technologies like AI. This creates a paradox: the organisations that need innovation most are least equipped to implement it.

The consequences of this skills crisis extend far beyond staffing

concerns. When experienced workers retire, decades of institutional knowledge walks out the door. Everything they know about equipment behaviour, failure patterns, and operational nuances is difficult to document or transfer.

EAM'S AGENTIC EVOLUTION

Agentic AI supports a paradigm shift from reactive to proactive asset management. These systems function as digital coworkers embedded within organisational workflows, continuously learning from interactions and taking autonomous action to optimise operational efficiency. Unlike conventional AI tools that provide recommendations or insights, agentic AI systems make decisions, execute tasks, and adapt their behaviour based on outcomes.

The transformation is particularly evident in health, safety, and environmental (HSE) compliance, where underreporting of incidents has long plagued industrial operations. AI agents can autonomously identify and log incidents from work orders, reinforcing safety measures that would otherwise go unnoticed.

SPECIALISED EXPERTISE THROUGH DIGITAL COWORKERS

Digital coworkers provide specialised expertise across multiple domains, from incident reporting and work order management to predictive maintenance strategies and inventory optimisation. Each digital coworker functions as a domain expert, bringing deep knowledge and continuous learning capabilities to their assigned responsibilities.

Intelligent asset cataloging represents one application where agentic AI demonstrates its value. Through machine learning algorithms, these systems automatically structure assets by conducting smart interviews, connecting Excel files, technical manuals, photographs, and facility data into coherent operational pictures.

The predictive maintenance capabilities of agentic AI systems integrate real-time sensor data with historical patterns to optimise maintenance scheduling and predict equipment failures. This proactive approach shifts maintenance from reactive responses to strategic interventions, reducing downtime and extending asset lifecycles.

Computer vision integration further enhances operational capabilities by enabling mobile-based parts identification and automated inventory management through image recognition. By taking a picture on their mobile device, technicians can access relevant information, order replacements, or update inventory records.

TRANSFORMING HSE COMPLIANCE AND OPERATIONAL SAFETY

Traditional incident reporting relies heavily on manual input and human judgment, leading to inconsistencies and underreporting that compromise safety outcomes. Digital co-workers can analyse work orders, maintenance logs, and operational data to identify potential safety incidents that might otherwise go unnoticed.

The system can correlate seemingly unrelated events, identify patterns that suggest safety concerns, and automatically trigger appropriate reporting and response protocols. As they process more data and observe more operational scenarios, they develop a deeper understanding of the conditions that lead to incidents, enabling more effective prevention strategies.

ENTERPRISE-READY ARCHITECTURE FOR INDUSTRIAL DEPLOYMENT

EAM platforms with fully embedded, purpose-built AI agents eliminate dependencies on external AI platforms, reduce complexity and potential security

vulnerabilities, while ensuring system reliability. Organisations can deploy these capabilities without workflow disruption or system migration, maintaining operational continuity while gaining advanced AI functionalities.

Organisations can scale their AI capabilities based on actual usage and demonstrable value, rather than making large upfront investments in uncertain technology. Mobile-first design ensures that agentic AI capabilities are accessible wherever they have most impact, which is often in the field where much industrial maintenance occurs.

The convergence of workforce challenges, technological advancement, and operational demands creates a unique opportunity for industrial organisations to reimagine their approach to asset management. Agentic AI provides a path forward that addresses immediate skills shortages while offering a stepping stone for future technological innovation.

As organisations begin their journey toward agentic AI adoption, the focus should be on building capabilities that enhance human expertise rather than replacing it. The goal is to create environments where AI handles routine operations so human experts can focus on complex problem-solving, strategic planning, and innovation.

The transformation of EAM through agentic AI is not just about technology. It's about creating more resilient, efficient, and safe industrial operations.



THE TECH BEHIND SCALING SUSTAINABLE ENGINEERING

By Satish Thiagarajan, Founder, Brysa

If you want to scale in sustainable engineering, you need to create ecosystems that will support your growth. Machines, tech, and IoT-powered field tools are an obvious step, but you need the systems to bring out their best.

Active sustainability is relatively new in manufacturing. Plants previously measured emissions only after problems had been detected, impacting performance or cost, but technology has changed that process. IoT sensors embedded across machines and facilities provide real-time data that can be automatically responded to, whether through alerts or AI prompts. It has changed operational sustainability entirely. But for it to work properly, manufacturers need a cohesive tech ecosystem.

Data collection is only useful if the right people can find it, access it, and use it. And if it influences decision-making and activates automated processes. And for that, you need a connected CRM system, which unites, collates, and informs, where environmental data, operational intelligence, and business decision-making flow seamlessly. There are multiple CRMs with the potential to do this, from Salesforce to Microsoft Dynamics 365, but whichever you choose, the aim is to create a single source of truth for your business, capable of driving action.

CONNECTING PHYSICAL ASSETS

Connecting physical assets directly to carbon accounting makes sustainability far more powerful. Instead of relying on estimates, periodic audits, or static reports, organisations can use continuous data from the physical world. This is where IoT becomes integral. By linking machines, facilities, fleets, and utilities to Salesforce or other CRMs, companies create a live bridge between operational activity and carbon reporting, turning sustainability into a dynamic, engineering-driven discipline.

Manufacturing shows this most clearly. When IoT data flows into a CRM, you don't just gain information, but real-time sustainability intelligence. It allows businesses to see what's happening more clearly than ever before. Perhaps most importantly, it allows them to take measurable action.

This might mean monitoring real-time energy consumption across machines and production lines to identify inefficiencies. Detecting equipment degradation early so maintenance can be scheduled before failures occur. Or tracking material use, machine idle time, and waste to optimise production and reduce environmental impact. As well as measuring environmental metrics such as air quality, refrigerant leaks, and water usage for sustainability reporting.

As you adopt these capabilities, you then have to find a way to scale the insights and share the knowledge.

WHY INTEGRATION DRIVES VALUE

For years, sustainability investments were justified mainly as protection against regulatory pressure. But when IoT, ESG data tools like Net Zero Cloud, sustainability data hubs like Data 360, and CRM analytics work together, the value extends well beyond compliance. Integrated sustainability data becomes a driver of efficiency, revenue opportunities, and long-term resilience.

Integrated systems simplify compliance through automation. Instantly reacting during disclosure cycles, helping organisations to gain reliable, continuously updated metrics that keep them ahead of tightening regulations.

IoT-driven insights reveal precise operational inefficiencies. Energy-intensive equipment, unbalanced loads, and unnecessary idle time are seen and can be acted upon. Predictive maintenance reduces downtime, extends tool life, and helps identify opportunities for immediate energy and cost savings.

Sustainability transparency is increasingly required in enterprise RFPs. Integrated data provides the verified metrics needed to compete for these opportunities. Accurate carbon accounting can also support participation in carbon credit markets, turning emissions reductions into potential revenue.

A unified sustainability intelligence layer enables organisations to model regulatory scenarios and forecast the emissions impact of new products or operational changes. This makes it easier to make informed decisions, whether shifting energy sources, optimising operations, or designing more sustainable products.

Integrating IoT, sustainability data, and CRM into a unified ecosystem can provide dramatic support for businesses, but it's rarely plug-and-play. There are many operational and technical challenges to be faced, often with the support of a third-party specialist. Addressing them early helps ensure a smoother and more reliable integration.

Manufacturing environments often include a mix of legacy and modern equipment using different communication protocols such as MQTT, OPC UA, Modbus, or HTTP. Without a unified gateway or middleware layer, these devices cannot consistently transmit data into your CRM. Protocol-agnostic IoT platforms and standardised ingestion layers help create a reliable data pipeline.

Sustainability insights are only as reliable as the underlying sensor data. Mis-calibrated devices, inconsistent sampling rates, or missing timestamps can distort energy or emissions reporting. Regular sensor calibration and validation rules within data platforms help maintain trustworthy, audit-ready metrics.

Connected devices expand the potential attack surface across operational networks. Secure device provisioning, encryption, identity-based access controls, and recognised security frameworks are critical to protecting data. Integrating IoT streams through Salesforce can also add governance through role-based visibility and centralised oversight.

Many manufacturers still rely on SCADA, MES, or older ERP systems that were not designed for modern data connectivity. Integration platforms, APIs, and industrial gateways can bridge these systems with modern data platforms, allowing sustainability data to flow without replacing existing infrastructure.

Building a connected, data-driven sustainability model requires more than new tools. The real value comes from creating a cohesive tech ecosystem to support it. It's not a technically easy process. But once you've laid the foundations, scaling sustainable engineering becomes a whole lot simpler.

THE FOOD SAFETY GAPS AUDITS KEEP FINDING — AND HOW MANUFACTURERS CAN CLOSE THEM

By Ann-Kathrin Kuehle, Industry Insights Manager, Mettler-Toledo

Read this, and more of the latest developments in food processing and packaging, online on **IN Food** in-food.co.uk/

Food safety standards and regulations across the globe are increasingly aligned. Global Food Safety Initiative recognised schemes such as BRCGS, International Featured Standards (IFS), Food Safety System Certification 22000 (FSSC 22000) and Safe Quality Food (SQF) share the same core foundation. These include Hazard Analysis and Critical Control Points (HACCP), Good Manufacturing Practice (GMP) and a demonstrable commitment to food safety culture. Yet despite this common framework, audits continue to uncover a strikingly consistent set of non-conformities year after year.

Data highlights the scale of the challenge: in 2024 alone, more than 100,000 non-conformities were raised under BRCGS Food Safety Issue 9, with manufacturers averaging just under five findings per audit. Around 59 percent of these findings fell under Section 4, covering site standards such as premises, equipment condition and hygiene, while Clause 4.11.1, which requires equipment and facilities to be maintained in a clean and hygienic condition, was the single most cited non-conformity in the 2024 to 2025 reporting period. These findings highlight a persistent gap between documented food safety systems and what can be consistently demonstrated during an audit.

While audit outcomes vary by sector, product type and geography, four recurring areas sit behind a large proportion of these findings. The first is the food safety plan itself. Many non-conformities relate to incomplete hazard analysis, poorly defined Critical Control Points (CCPs) or inadequate monitoring of CCPs. HACCP remains the backbone of food safety management, yet audits frequently reveal confusion around its practical application, particularly when it comes to validation and verification. Manufacturers may treat validation and verification as documentation exercises rather than as proof that controls performance effectively under real operating conditions. Clear process mapping, correctly positioned inspection



points and robust data capture all help close this gap and support audit ready records across the seven principles of HACCP.

Hygienic design and GMP form the second major area of concern. Across BRCGS, IFS and SQF audits, hygiene, cleaning and sanitation consistently account for a high proportion of findings. Equipment that is difficult to clean, inspect or maintain increases both contamination risk and audit exposure. Preventive maintenance programmes are often in place, but corrective actions may not be clearly defined or verified for effectiveness. From an audit perspective, hygienic design is not just about materials and surfaces, but about demonstrating that equipment can be cleaned effectively, maintained predictably and returned to service without introducing new risks. Inspection systems designed for washdown environments and hygienic operation support this requirement by reducing both operational and audit complexity.

Allergen management and physical contamination control represent the third recurring issue. Mislabelling remains one of the most serious risks facing food manufacturers, with incorrect or missing allergen declarations capable of triggering recalls even where the product itself is safe. Audits also continue to flag weaknesses in foreign body detection and verification. Checkweighing, metal detection, vision and x-ray inspection are increasingly seen as complementary tools, supporting both label accuracy and physical contamination control as part of a risk-based strategy.

Food safety culture underpins all technical controls. Audit data repeatedly highlights gaps in training, competency and supplier oversight. Weak raw material controls, limited understanding of food safety responsibilities and inconsistent adherence to procedures all increase the likelihood of non-conformities. Training, supported by clear processes and measurable controls, remains essential to embedding food safety into day-to-day operations.

Ultimately, audit trends show that most non-conformities are not isolated failures. They are symptoms of food safety systems that lack integration between people, processes and technology. When inspection technologies are selected and positioned based on risk, designed for hygienic operation and supported by meaningful data, they become a core part of the food safety management system rather than a last line of defense. In this way, audits move from repeatedly identifying the same gaps to confirming that effective controls are in place and working as intended.



HOW PREDICTIVE MAINTENANCE CAN HELP UNLOCK PRODUCTION FLEXIBILITY

By James Scott, condition monitoring specialist,
SEW-EURODRIVE UK & Ireland

The industry talks up digital transformation, yet many manufacturers remain constrained by hardware-defined systems that limit flexibility and slow progress.

Rigid factory architectures can't adapt quickly enough to the regular supply chain disruptions and production fluctuations we're facing, while engineering teams are staying stuck in "pilot purgatory", never scaling the implementation of new technologies across the board.

It's time for manufacturers to future-proof operations by shifting to software-defined factories, where flexibility is built in from the outset and production is optimised through a digital control layer rather than fixed hardware, which limits the type of software that can be installed.

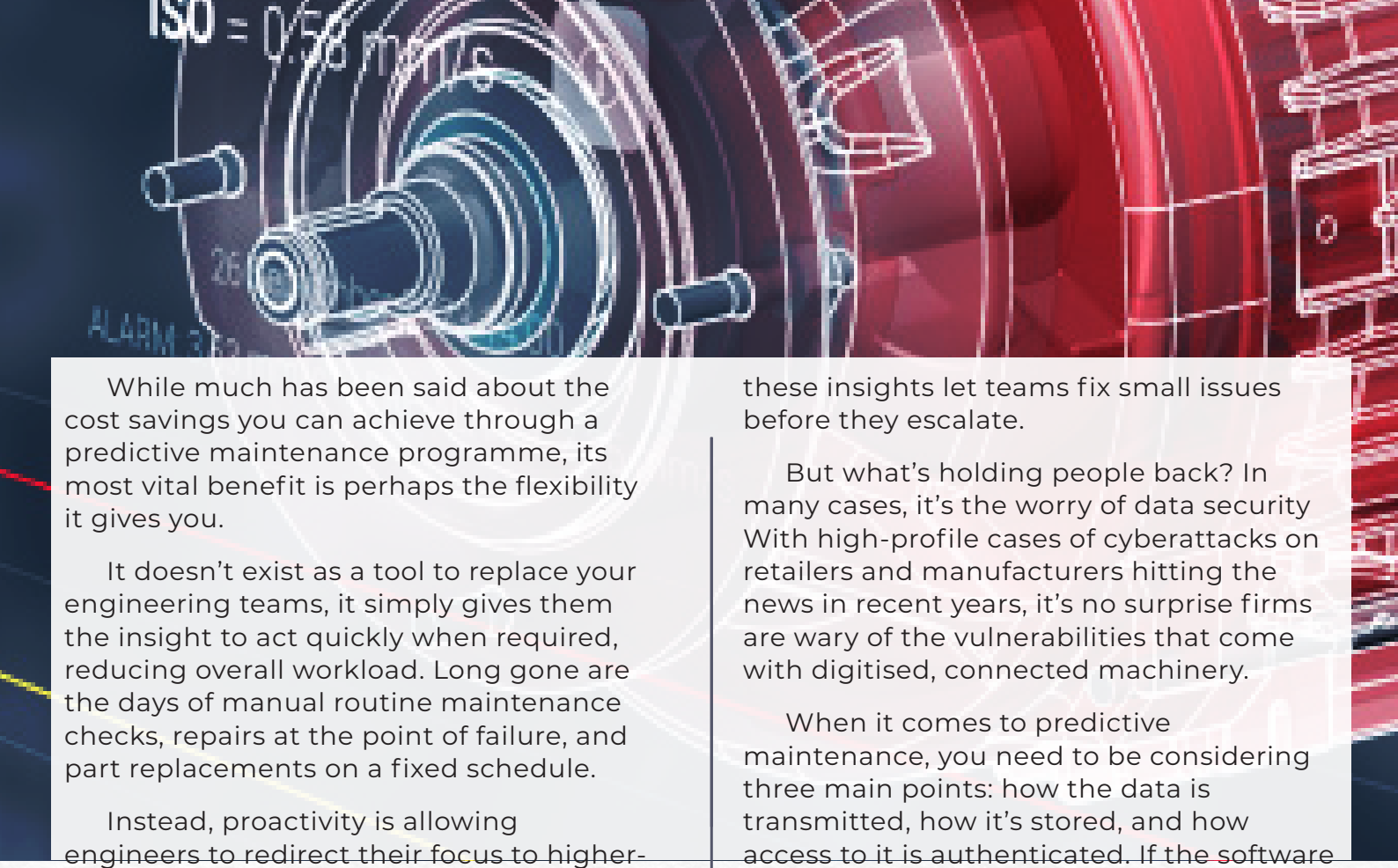
But with these factories often taking years to fully implement, how do you test your readiness for a factory built entirely on software? This is where predictive maintenance comes in.

YOUR FIRST STEP INTO DIGITAL TRANSFORMATION

Acting as the critical testing ground for a software-defined factory, successfully introducing predictive maintenance software to your production line validates that you have the digital infrastructure in place to monitor and predict equipment behaviour in real-time.

Your first step to implementing predictive maintenance is to identify your most critical assets: the ones which could cause the most significant safety production issues should failure occur. Once you've decided which parts of your system are the priorities, the next step is to deploy Internet of Things (IoT) sensors, which will monitor parameters including vibration and temperature.

These tools transmit information to a centralised system, often a cloud-based platform, where data is processed and analysed to detect patterns and anomalies. It can identify early signs of issues, like abnormal vibration in packaging machines which could lead to bearing failure if not caught soon enough.



While much has been said about the cost savings you can achieve through a predictive maintenance programme, its most vital benefit is perhaps the flexibility it gives you.

It doesn't exist as a tool to replace your engineering teams, it simply gives them the insight to act quickly when required, reducing overall workload. Long gone are the days of manual routine maintenance checks, repairs at the point of failure, and part replacements on a fixed schedule.

Instead, proactivity is allowing engineers to redirect their focus to higher-value challenges, like the long-term integration of digital processes on the factory floor, future-proofing the sector to adapt to continued market and supply chain volatility.

PREDICTIVE MAINTENANCE IN PRACTICE

At SEW-EURODRIVE, we've helped multiple customers to implement condition monitoring, moving from a "fix it when it breaks" model to using real time data to determine when action is needed before it becomes a costly repair.

We performed a trial at a major UK luxury car manufacturer's paint shop, monitoring six drives across three spray booth conveyors looking for patterns in the data. We found that one conveyor consistently required more current to run, which indicated paint build-up – an issue that, if left unchecked, could have increased energy use and caused costly mechanical failure.

And with manufacturing downtime costing thousands of pounds an hour, these insights let teams fix small issues before they escalate.

But what's holding people back? In many cases, it's the worry of data security With high-profile cases of cyberattacks on retailers and manufacturers hitting the news in recent years, it's no surprise firms are wary of the vulnerabilities that come with digitised, connected machinery.

When it comes to predictive maintenance, you need to be considering three main points: how the data is transmitted, how it's stored, and how access to it is authenticated. If the software you're working with uses encrypted, one-way data transmission, secure cloud infrastructure, and certificate-based authentication, then you're already adhering to industry best practices.

By having strong digital foundations in place, you can begin to develop the system connectivity that underpins more advanced production environments. Over time, this allows production systems to move away from rigid, hardware-led decision-making, instead using operational insight to adjust processes, plan interventions and optimise performance with far greater agility.

Now is the time to put the building blocks in place for the software defined factories that will help you maintain more responsive and adaptable production in the years to come.

THE MACHINES THAT NEVER SLEEP

WHAT MAINTENANCE REALLY MEANS IN LARGE-SCALE FIBRE AND CORRUGATED MANUFACTURING

Manufacturers are operating in an unusually unforgiving environment. Geopolitical instability continues to disrupt global supply chains unpredictably. Relentless pressures from multiple directions at once are squeezing margins, be it energy, raw materials, employment costs or logistics. In that context, every variable inside your own four walls becomes more important. The things you can control matter more when the things you cannot are increasingly unpredictable.

At Cullen, we are a large-scale UK manufacturer of both moulded fibre and corrugated packaging, operating from a 14-acre facility and producing over a billion units across our two production streams in the past two years alone. We supply sectors as diverse as fresh produce, medical, retail, food service, eCommerce, cosmetics, healthcare and industrial. Each has its own exacting standards and delivery expectations.

If there is one lesson that decades of manufacturing at that scale teaches you, it is this: your maintenance programme is an asset, not a cost centre. It is the foundation on which output quality, delivery reliability and customer trust stands or falls, across both production lines, every shift, every day.

Cullen's moulded fibre operation is built on a principle that shapes everything about how we approach maintenance: we design and build all of our own moulded fibre production equipment in-house, with a dedicated team of qualified engineers who live and breathe the machinery they have created. Our corrugated line is maintained by that same team, with deep process knowledge built over generations of continuous operation.

That matters more than ever in the current climate. When supply chains are fragile and lead times are unpredictable, relying on an external OEM for a specialist engineer or a proprietary part is a vulnerability. When something needs attention on our moulded fibre line, our in-house engineering team designed it so they know it intimately. Therefore they can diagnose, fix or iterate on it without waiting on anyone else.

The knowledge stays in-house when we invest in upgrading equipment, as we do continuously, with over £1M in annual manufacturing investment. Process refinements do not disappear when a supplier changes its support model. Decades of accumulated equipment knowledge live in the building, in the people, and in the systems.



PROCESS CONTROL, NOT GUESSWORK

Moulded fibre production is often assumed to be a simple forming process. In reality, it is a highly controlled balance of material behaviour, tooling precision and process conditions. All of which must work together consistently at scale.

At Cullen, much of our focus in recent years has been on refining how that control is achieved. On the forming side, we have re-engineered key stages of the wet pressing process. This is the point at which fibres are compressed, shaped and stabilised. By tightening tolerances and improving how pressure is applied across different product geometries, we are able to produce stronger, more consistent products with a smoother finish, while reducing variability across runs. These improvements have been developed and implemented in-house, through extensive trial, iteration and engineering investment.

Alongside this, we have transformed how process inputs are managed. Historically, elements such as dosing and material conditioning relied on manual systems that could introduce variation. Today, these are centrally controlled and automatically regulated, ensuring precise, repeatable inputs across every production run.

The result is not just improved product performance, but a more stable manufacturing process overall. Greater control at this level reduces waste, improves visual consistency and strengthens reliability — all of which ultimately matter to the end customer, even if they never see the complexity behind it.

It is a reminder that in modern manufacturing, “maintenance” is not just about keeping machines running — it is about continuously refining how the process itself performs.

THE WORKFORCE IS PART OF THE MAINTENANCE PROGRAMME

Technology alone does not keep a manufacturing operation running. The people operating and maintaining equipment carry knowledge that cannot be fully codified in a system or a manual. At Cullen, that operational expertise has been built over decades, and it is something we are deliberate about retaining and developing across both production streams.

Much like a Formula 1 driver who can detect a five-millimetre difference in steering wheel position before the telemetry catches it, a skilled engineer who knows a machine well will often sense something is off before any sensor flags it. For them, it might be a slight change in sound, a subtle variation in output. That kind of embedded knowledge is extraordinarily difficult to replicate quickly, however much capital a competitor deploys. It accumulates slowly, through repetition, through problem-solving, through years on the factory floor.

For us, retaining and developing that workforce is also a maintenance strategy.

PLANNED INTERVENTION BEATS REACTIVE FIREFIGHTING

The shift from reactive to planned maintenance is not a new concept, but executing it consistently in a pressured production environment is harder than it sounds. When margins are tight and output targets are close, the temptation to defer a scheduled intervention is real. It is also a short-term calculation that tends to produce long-term costs.

Our view is that the maintenance schedule is non-negotiable precisely because the production schedule depends on it. The two are directly linked. An hour of planned downtime for a scheduled intervention is almost always cheaper than the unplanned equivalent, in both time and cost. In a year when every input cost is rising, that arithmetic has never been more important. It matters whether you're running a corrugated line processing millions of square metres of board annually, or a moulded fibre suite turning waste paper into precision packaging for the medical sector.

Reliable maintenance does not just reduce downtime. It creates the operational headroom to take on more complex customer requirements and to deliver on them confidently. When your production process is stable and predictable, you can commit to timescales. When your equipment is well understood, you can adapt it for bespoke customer needs without gambling on reliability.

That is how Cullen has been able to deploy rapid solutions for customers, replacing plastic packaging with a moulded fibre alternative in weeks, not months. Whether that is a spike in supermarket demand for fresh produce trays, a doubling of paint packaging orders from a major retailer, or an urgent requirement from a healthcare customer with zero tolerance for supply failure, responsive scale at speed is only possible when the manufacturing foundation is solid.



In an environment where customers across retail, medical, food service and industrial sectors are themselves under pressure, they need supply chain partners they can genuinely depend on. That operational reliability is what makes the difference.

Maintenance rarely makes the headlines. Investment announcements do. New product launches do. But in a high-volume manufacturing environment (especially one operating in the tough conditions we face in 2026) it is the consistency of the maintenance programme that determines whether all those other ambitions are achievable.

External costs will keep rising. Supply chains will keep throwing surprises. The one variable a manufacturer can genuinely control is the reliability of its own operation. We have spent decades building the process knowledge, the engineering capability, and the operational discipline to do exactly that across multiple production lines, serving customers in 35 countries, producing at a scale measured in billions of units.



WHY PLANNED MAINTENANCE MATTERS FOR INDUSTRIAL ESP SYSTEMS

By Ed Everett, Technical Sales Manager, Castlet

In energy-intensive industries such as petrochemicals, power generation and steel production, Electrostatic Precipitators (ESPs) are essential for maintaining plant efficiency and keeping emissions within regulatory limits.

When ESP power control systems fail unexpectedly, the consequences can be highly disruptive – potentially causing costly downtime and non-compliance with environmental standards.

Planned maintenance of ESP power control systems is therefore crucial in preventing problems before they occur. Engineers must prioritise proactive maintenance strategies to help avoid failures and the cost implications of emergency callouts.

With air pollution rising, advanced engineering solutions play a key role in helping heavy industries ensure particulate emissions remain within regulatory limits.

ESPs remove fine particulates from industrial exhaust gases using electrical energy. The power control system supplies and regulates the high-voltage and current required to charge the particles so they can be captured efficiently.

ESP systems typically use transformer-rectifier units and electronic controllers – such as Castlet's MCS III series – to manage voltage, current, and rapping sequences. Over time, electrical stress, high temperatures, and environmental exposure can lead to deterioration.

Common issues include transformer-rectifier faults, corroded connections, and poor cooling. If left unresolved, minor faults can escalate quickly, reducing efficiency and increasing emissions.

THE IMPLICATIONS OF UNPLANNED FAILURES

When breakdowns occur, emergency callouts are often unavoidable but bring higher repair costs, production losses, and potential regulatory breaches. These reactive responses can strain internal teams and frequently result in temporary fixes rather than long-term solutions.

For continuous-process and regulated industries such as refining and petrochemicals, even short disruptions can lead to significant financial and environmental consequences. Temporary breaches may trigger fines, mandatory shutdowns, or damage environmental credentials.

PLANNED MAINTENANCE MATTERS

A proactive maintenance programme allows operators to identify and resolve potential faults before they lead to outages. Although approaches vary depending on the specific system, programmes typically involve regular inspections, testing, cleaning, and component checks.

This improves reliability, extends equipment life, and helps ensure emissions remain within specification. Planned maintenance also enables operators to manage budgets more



effectively and schedule work around production windows.

By analysing data from modern control systems – such as voltage trends, spark frequencies, and alarm histories – engineers can detect early warning signs and adjust maintenance schedules accordingly. Over time, this builds a clearer picture of system health, improving both reliability and compliance.

To maximise uptime, maintenance activities must align with wider plant shutdowns and production cycles. Effective planning includes keeping essential components such as controllers, transformer-rectifiers, cooling fans, and power components readily available.

Operational data can also be used to forecast component lifecycles and schedule maintenance using a more data-driven approach.

Planned maintenance programmes often incorporate system upgrades, such as retrofitting legacy controllers with newer models like Castlet's MCS III. These upgrades can improve performance and diagnostics without the cost of replacing entire systems.

Maintaining clear service records and feeding lessons learned into continuous improvement cycles also helps integrate maintenance into ongoing plant operations. A dedicated engineering partner can support this process by providing consistent service and technical insight.

Even with a solid maintenance plan, unexpected failures can still occur, but they should be the exception rather than the rule. Establishing a relationship with a trusted engineering partner ensures rapid response when required, while planned maintenance remains the foundation of system reliability.

Compared with reactive repairs, scheduled maintenance delivers lower total cost of ownership, longer asset life, and greater operational stability.

Castlet recently delivered a rolling transformer-rectifier refurbishment programme at a UK waste-to-energy facility, extending the life of 20-year-old equipment while keeping the plant fully operational.

Electrostatic precipitators in waste-to-energy facilities rely on transformer-rectifiers to operate safely and efficiently. During a proactive site visit, Castlet engineers found that some of the original units had been operating in challenging conditions, with steel tanks heavily corroded due to prolonged exposure to standing water.

As a long-standing service partner, Castlet recommended a detailed site survey and refurbishment strategy. Two units at a time were transported to the company's Lincoln facility for diagnostic testing and refurbishment.

This cost-effective approach reused transformer components where possible, reducing waste and minimising downtime. The programme successfully restored performance and extended the life of the units for many more years.

FUTUREPROOFING THROUGH PROACTIVE MAINTENANCE

As ESP systems across the industrial sector continue to age, planned refurbishment and maintenance programmes provide a practical long-term solution.

Routine inspections, calibration, and testing help ensure ESP power supplies and controllers perform reliably under demanding conditions. Early fault detection minimises downtime and maintains compliance, while upgrading legacy systems to modern platforms such as the MCS III improves diagnostics and extends asset life.

Castlet's work demonstrates the value of supporting equipment throughout its lifecycle through a planned maintenance programme. By investing in planned maintenance rather than relying on emergency callouts, operators gain operational stability, predictable costs, and greater peace of mind – keeping plants running efficiently and emissions under control.




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HIGH POWER COSTS CHOKE INDUSTRIAL INVESTMENT

As ministers prepare their response to the British Industrial Competitiveness Scheme consultation, manufacturers are warning that high electricity costs are no longer simply eroding margins, but holding back investment in electrification, automation, and digital efficiency.

UK industry's energy cost problem has moved beyond an operational complaint about overheads and into something more damaging: a direct brake on industrial modernisation. A joint CBI and Energy UK report published in February said that almost 90% of businesses had seen their energy bills rise over the past three years, with four in ten saying they would cut back investment as a result. At the same time, the government's consultation on the British Industrial Competitiveness Scheme closed on 19 January 2026, and ministers have yet to publish the outcome, leaving manufacturers waiting for detail on a policy that has already become part of a much bigger argument about competitiveness.

David Hall, President, Schneider Electric UK&I, argues that "high energy costs are placing a stranglehold on UK industry, such as manufacturing and data centres, hindering its ability to invest in electrification and digital technologies that are essential for modern, competitive production". It is a pointed assessment, but it also reflects the broader line now coming from industry groups: electricity prices are no longer a side issue to be managed through procurement alone. They are shaping whether businesses can justify capital spending on cleaner processes, automated lines, and more digitally connected production.

"Lowering the cost of power must be a priority," he says, "if businesses are to switch from fossil fuels, adopt automation, and scale digital solutions that improve efficiency and productivity."

The government's own BICS proposal is explicitly designed to reduce electricity costs for eligible manufacturing businesses by exempting them from the indirect costs of the Renewables Obligation, Feed-in Tariffs, and the Capacity Market, with expected savings of £35 to £40 per MWh. Yet Hall is right to add that "industry needs a long-term plan and solutions - not short-term fixes," because the proposed scheme is not due to commence until April 2027.

The urgency becomes clearer when set against the wider international picture. Energy UK and the CBI say UK industrial electricity prices remain nearly two-thirds above the median of IEA countries and are the highest among G7 members. That leaves businesses facing a structural cost disadvantage just as they are being asked to electrify more processes and invest in cleaner, smarter plant. Hall's warning is therefore less a corporate talking point than a reflection of a persistent industrial dilemma: the transition to lower-carbon production becomes harder to finance when the power needed to run it remains stubbornly expensive.

Price, however, is only part of the story, and Hall's comments are stronger when he turns to infrastructure. "Progress to electrification is also being held back by an ageing grid infrastructure that is no longer fit for purpose," he says. That concern sits squarely within current policy discussions. Government has tied electricity cost reform to wider grid

changes, including a Connections Accelerator Service pilot intended to give priority projects quicker access to the network, while other official statements point to reform of the grid connections process as part of the same competitiveness agenda. Hall's argument that "carefully managed grid upgrades will bolster resilience, secure energy independence and bring down the cost of electricity to more affordable levels" reads, in that context, as a challenge to move faster rather than simply subsidise the status quo.

"Alongside electrification, digitalisation is key to boosting competitiveness and innovation," Hall says, adding that "adopting readily available digital tools to improve efficiency and reduce costs is key - especially at a time where energy costs are at an all-time high." That ties neatly to the Energy UK finding that non-commodity costs now make up the majority of many business electricity bills, which means reducing waste, shifting load, and improving visibility over consumption are becoming financial priorities, not simply sustainability initiatives.

The government's response to BICS will show whether ministers see electricity costs as a narrow support issue or as part of a broader industrial strategy. If Hall is right, and high power prices are already choking off investment in electrification, automation, and digital tools, then a limited relief scheme on its own will not be enough. The sharper test is whether policy now catches up with the industrial reality he describes: that by "embracing electrification, automation, and digitalisation, the UK can revitalise its industry, create jobs, and drive sustainable economic growth" — but only if the economics and the infrastructure stop pulling in the opposite direction.



PREPARING AUTOMATION FOR FUTURE GRIDS

By Stefan Hufnagl, Industry specialist – Energy, ***COPA-DATA***

According to a McKinsey report, power grids must adapt to rapidly increasing shares of renewable energy sources, with electricity demand expected to increase by roughly 40 per cent from 2020 to 2030 – forcing utilities to rethink automation and control strategies to maintain reliability in more dynamic networks.

As the smart grid develops, software in the form of tools, algorithms, and platforms is playing a fundamental role. Numerous entities within the power system must communicate with one another, exchange control signals, assess forecasts, report yields or consumption, and optimise energy flows.

Even infrastructure that appears rigid at first glance – such as high-voltage lines or substations – is gradually adopting more flexible, software-based approaches. This is supported by digitalization trends that enhance safety, productivity, and connectivity across energy systems, according to analyses from the International Energy Agency (IEA).

This shift is being driven by rising energy demand and the growing integration of decentralized renewable energy sources. Photovoltaics and other distributed assets feed variable amounts of energy into the grid, depending on weather conditions. These dynamics affect substations directly, increasing the demands placed on protection, automation, and monitoring systems.

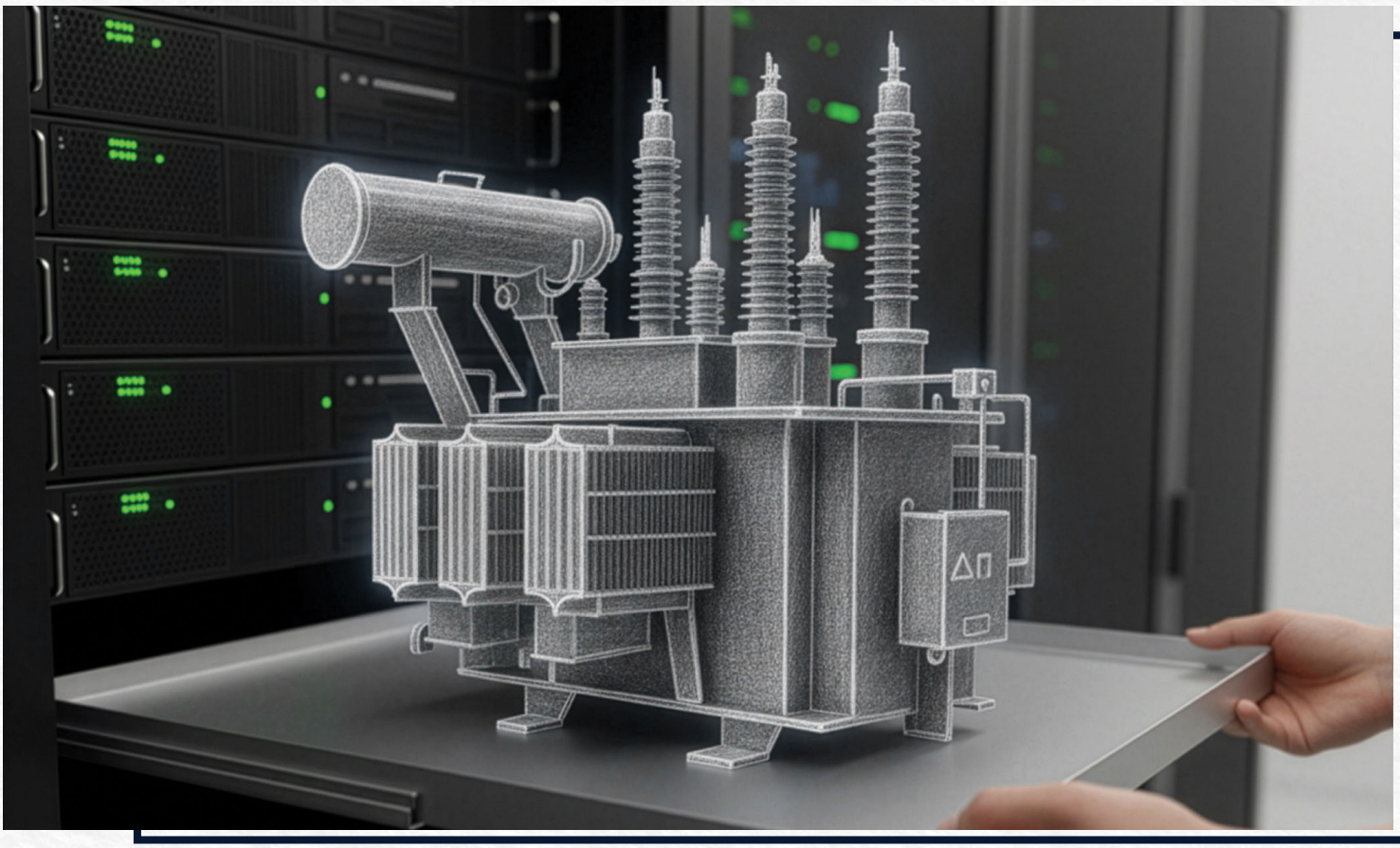
Grid expansion and modernisation are accelerating. Network operators are building and upgrading more substations than ever before, while also being required to monitor, maintain, and operate an expanding fleet of systems. This workload is becoming increasingly difficult to manage with traditional, hardware-centric automation concepts.

Modern substations often contain dozens of intelligent electronic devices (IEDs), each responsible for specific protection or control tasks. Installing, configuring, testing, and maintaining these devices represents a significant cost over the lifecycle of a substation. As system numbers grow, so does operational complexity.

CENTRALISATION OF PROTECTION TECHNOLOGY

Centralised architectures offer a way to address these challenges. Instead of distributing protection functions across numerous individual devices, protection unit instances from multiple bays can be consolidated on a central server within the substation. Only the components required to digitally connect the primary equipment – such as merging units or switch control units – remain in the bays themselves.

This approach simplifies configuration and maintenance while enabling more direct communication between protection functions. It also supports advanced station-level applications,



including disturbance recording, adaptive protection settings, condition monitoring, and cybersecurity supervision, all of which benefit from access to data across multiple feeders.

FROM HARDWARE-BOUND DEVICES TO VIRTUALISED FUNCTIONS

Virtualisation takes centralisation one step further by decoupling software from hardware. Rather than being delivered as fixed-function devices, protection, and automation functions are provided as software components that can be deployed on a common hosting platform.

Much like modern smartphones that allow users to add or modify functionality through apps, virtualised substations enable functions to be expanded or adapted over time. This creates a flexible, software-defined environment in which automation, protection, human machine interfaces (HMI), and higher-level applications can coexist and evolve.

The advantages of virtualised substation automation include improved scalability, more efficient spare-parts management, faster commissioning, and greater flexibility through software-based configuration. At the same time, the transition introduces challenges related to redundancy, parallel operation of different system generations and the need for new skills at the intersection of IT and OT.

Standards such as IEC 61850 provide an essential framework for interoperability and vendor-neutral integration, supporting the gradual adoption of virtualized architectures without disrupting existing operations.

Substation virtualisation is not about replacing existing systems overnight. Instead, it offers a practical way to modernise automation step by step, while keeping substations reliably operational at all times. Vendor-agnostic software platforms help bridge conventional, digital, and virtualised substations, enabling operators to manage today's challenges while preparing for the grids of tomorrow.

UNLOCKING THE FACTORY FLOOR:

HOW AI AND MACHINE LEARNING ARE TRANSFORMING MACHINE DATA INTO MANUFACTURING INTELLIGENCE.

By Keith Smith, Co-Founder & COO, IntelliAM

Every day across thousands of factory floors, machines are speaking but almost nobody is listening. Embedded inside every plant and every machine across the world is a continuous stream of operational intelligence. It's hidden and untapped not because the technology doesn't exist, but because there is a disconnect between data and context.

But manufacturers do now have the ability to unlock billions of data points hidden inside existing machinery. It's possible to tune into alarms, settings, running parameters, product data and reliability sensor inputs like temperature, vibration and stress wave, and, contextualise that data.

Manufacturers are now able to connect and layer data to understand what 'normal' should look like for each machine under each operating condition. Better still, they're harnessing AI and ML in a way which doesn't require a costly rebuild and utilises what already exists on the factory floor.

Manufacturers are already deploying AI-driven condition monitoring which is unlocking untapped productivity gains, energy efficiency, waste, downtime, throughput, and quality.

IntelliAM, the company I co-founded in 2023, now works with half of the world's top 12 food and drink manufacturers including well-known names including Müller, Mars, ADM, Hovis, and Diageo.

In practice, through using contextualised insights from machinery data, failure rates reduced and achieved, we helped Müller achieve an average of 215% improvement in mean time between failures.

Another client Hovis achieved ROI in less than 12 months through deployment of an AI-powered maintenance system that applies machine learning to asset data in real time resulting in an 80%+ reduction in maintenance costs.

The manufacturers who are already integrating AI and ML within their systems are asking the right questions, demanding transparency from their technology, and are now building systems that get smarter over time.

CUTTING THROUGH THE HYPE

However, there are many manufacturers who struggle to separate genuine technology from hype.

Underhand approaches, technical jargon, and empty promises from some tech providers are creating doubt and confusion around AI, undermining confidence in what, when implemented correctly, can deliver real operational improvements.



The key is to adopt a system which offers transparency, actionable insights, clear metrics and flexible connected systems. Manufacturers who avoid the pitfalls of technical debt and underdelivering solutions tend to share the same foundations, built on three principles applied consistently from the start.

Effective AI in manufacturing doesn't emerge from a single breakthrough, it's built on three things done consistently well.

The first is architecture. Many AI initiatives struggle not because the technology fails but because it wasn't designed to scale or integrate.

A question to ask is whether the proposed solution can communicate seamlessly with every other system in the business? If the answer is no, then it is not the right foundation for digital transformation – it is the beginning of technical debt.

A unified data structure where machines, systems, and sites share a common language is what allows AI and machine learning to scale across an entire operation.

Second is data quality. Raw vibration data captured as time waveforms and processed through frequency analysis reveals what summary figures cannot: impacts, brief anomalies, modulation patterns, and bearing faults.

Overall vibration values reduce all of that to a singular figure and in doing so takes away the detail that predictive models need to perform. As a result, false alarms increase, maintenance decisions become less precise, and engineering teams gradually lose confidence. Feeding AI models richer, rawer vibration data and translating that into clear, actionable outputs is what separates genuine predictive capability from an expensive dashboard that nobody trusts.

The third is the human layer. As experienced engineers retire and skill gaps widen, the risk isn't just losing people it's losing the domain expertise they carry. Predictive AI is most effective when it is guided by industry knowledge and practical experience, not just software capability.

The most effective AI systems embed that expertise into connected workflows, making it accessible across shifts and experience levels.

Using AI and machine learning should not look to replace engineering judgement but instead it should extend it, giving every engineer on the floor access to the kind of contextual intelligence that was previously locked inside the heads of your most senior staff.

The data already exists. The technology is proven. The manufacturers already acting on it are not chasing a trend, they are building a fundamental competitive advantage that will compound over time.

Those who wait will fall behind, and with that the gap will widen between operations that learn and adapt and those that don't.

The factory floor has never had more to say. The only question left is whether manufacturers are ready to listen.

WHY ASSET MONITORING NEEDS A TRANSLATION LAYER

By Ivan Harjaček, Head of Digitalisation,
ANDRITZ Feed & Biofuel

As operating costs and competitive pressures mount across the industrial sector, the appetite to digitalise processes has never been greater – and feed mills or biofuel plants are no exception. Today, 87% of UK SME manufacturers are planning automation investments within the next two to five years, and automation across manufacturing is expected to more than double by 2030. For process industries such as feed production and biomass pelleting, data capture and analytics sit at the center of these upgrades, promising smarter, faster, and more efficient operations.

But walk into most modern feed mills or biofuel plants today, and the reality is very different. Sensors are logging, PLCs are monitoring inputs and outputs, and SCADA systems control operations – all the signs point to these being data-rich environments. Yet many of the operators running them are still not able to access the bigger picture that helps them make informed decisions.

The issue is not the data itself, but the way it is being processed and used. Which is not a problem that yet another sensor will solve. To use the data to its full advantage, human intervention is required, helping build a strategy that can make feed and biofuel production processes future fit.

THE INSIGHT GAP

Most feed mills have already made a major investment: sensors are installed and systems are running, collecting, and storing data. But still, operational decisions remain reactive and often guided by gut instinct rather than hard evidence.

Technology has never been the problem when it comes to insight. But process operators are finding themselves drowning in a sea of data, as the sheer volume overwhelms traditional analysis methods, resulting in less-than-optimal decisions. Raw signals, trend lines, and vibration graphs can tell a trained engineer a great deal, but they are less useful to team members not so close to the process, such as a plant manager or a CEO. The gap between what a monitoring system produces and how that information is acted upon is where the real inefficiency lies.

A decision-maker in a plant does not need a vibration trend graph, but rather a pathway on how to convert and implement the necessary data – turning what might be obscure into actionable insight. If a business can't understand

how to use the technology they have effectively, then there is little reason to implement it. Operators need plain-language answers with simple flags: is this machine at risk, how serious is it, and what should be done about it?

Data on its own cannot produce a roadmap; it requires human input to help build a clear strategy by extracting its value. This is where partners like ANDRITZ come in, supporting feed mills and biofuel plants in their journey to turn a spreadsheet full of numbers into actionable insight.

TRANSLATING RAW SIGNALS INTO USEFUL DATA

Useful industrial monitoring should be like a fitness watch. Wearing it doesn't make you an athlete, but it tracks relevant data to enhance athletic potential. It contextualizes a raw signal into something personally meaningful and immediately actionable. That is exactly the standard that asset monitoring should be held against. Sharing clear information on the risk, severity, likely cause, and recommended action, presented in plain language to the person who needs to act on it.

For manufacturers feeling the pressure to adopt AI and stay ahead of the curve, it's worth pausing to ask whether the proper foundations are in place first. AI and advanced optimisation tools are only as good as the data fed into them, and if that data is not structured and understood, the results will reflect that. Building a strong data-to-insight layer is not a step that can be skipped in the race to modernise. It should be a standard across modern feed mills, turning raw data into decision ready insight.

Most manufacturers do not need more sensors or more data. They need to make better use of what they already have. That only comes from contextualised, decision-ready insight. ANDRITZ helps bridge that gap, turning what feed mills and biofuel plants collect into something operators and decision-makers can actually use. Get that foundation right, and everything else becomes possible.





RFID & ASSET MONITORING

By Benoit Charnallet, Product Manager,
TSC Auto ID EMEA

Choose any industry and there's a good chance it has an issue tracing its static or portable assets, anything from laptops and handhelds to high value machine tools and construction equipment.

Manufacturing staff are said to spend 2.5 hours a week locating tools and components, which could halt assembly processes and affect productivity. And a US report revealed that 20% of school assets worth $280,000 were unaccounted for when audited.

Asset lifecycle information management is often a key responsibility for project managers (PM), not just knowing where the item is located but also if and when it needs servicing or replacing, or if it's gone missing.

In large organisations, getting definitive answers to such questions can be difficult, time-consuming, costly, and error-prone. Often, an entire team needs to devote overtime just to gather this data, which is expensive and usually unpopular with employees! Even with overtime to locate and identify assets, many remain unaccounted for because of basic human error.

And while most large organisations have a barcode-based system in place to initially register or check-out assets, many items get lost later down the line when the time comes for users to find them. This is the classic catch 22 of barcode-based asset tracking systems.

In Government institutions like education, healthcare and defence, where budgets are limited and usually heavily regulated, any damage to, or shrinkage of assets can also have dire consequences. Investing in asset tracking and RFID labelling technology can not only save organisations time, money and reputation but also enhance security by reducing the risk of tampering and shrinkage.

RFID can minimise the downtime employees might spend searching for missing kit or misplaced components. It can also minimise insurance claims and the cost or replacing lost tools. And when it comes to lifecycle management, RFID can help monitor asset usage and performance, enabling PMs to schedule preventive maintenance.

HIGHLY ADAPTIVE RFID-TAGGING

RFID-tagged assets can be quickly located and tracked with a significantly higher degree of accuracy than manual scanning of barcodes.

Once items are tagged, RFID readers fixed at various locations and chokepoints, allow PMs to track an asset's movement and tie its data into the



organisation's main software systems.

Reading the tags can either be automated at pre-defined intervals, or on-demand. The on-demand option requires the use of handheld devices to locate and identify individual assets or contents within an entire pallet of assets.

The tags used for such asset tracking processes usually also have printed information on their label. This serves as a backup record to the RFID processes.

Given that assets can vary in terms of size, construction, and physical form, different tag types are often needed for different asset classes. An on-metal tag might be the best solution for laptops, whereas a very small label might be needed for a handheld barcode scanner.

IN-HOUSE OR SERVICE BUREAU?

Many large enterprises have their own RFID printers for asset tracking applications, while other organisations use service bureaus to pre-print and pre-encode tags in large volumes, and ship them to the user to be managed on-site by PMs or users.

TSC Auto ID is a leading provider of RFID printers. Its devices are used extensively by service bureaus and other large entities for asset tracking applications. Its printers have been tested and validated with many tags used in asset tracking, such as on-metal tags, returnable transport item (RTI) tags, and flag tags.

RFID tagging is an effective way for organisations to monitor and improve the accuracy and lifecycle management of their high value assets.



IN CONVERSATION RAFAEL NAREZZI, CENTRII

Centrii is a specialist in OT cybersecurity, particularly for critical renewable energy infrastructures. Whether the aim is regulatory compliance or operational resilience, Centrii has extensive experience supporting industry amid growing threats.

Fresh off the company's rebrand from Cyber Energia, we speak with Centrii's Co-Founder, Rafael Narezzi, about the state of the industry and the far-reaching effects of cyber risk.

You've just rebranded from Cyber Energia to Centrii: what's driving the change now, and what should customers understand as materially different beyond the name?

"The shift to Centrii reflects more than just a name change. It reflects an important repositioning and a clear alignment with where the cybersecurity industry is moving, the threats that are emerging and the support we're offering to energy operators.

"Centrii comes from two core ideas, sentinel, always vigilant, and central hub where distributed operational data converges. At its core is industrial intelligence.

"Our work sits at the intersection of operational technology (OT), cybersecurity and critical infrastructure – an environment that demands clarity and confidence – together with decentralised energy assets, battery energy storage systems (BESS) fleets, substations, inverter networks, which are all interconnected and increasingly digitalised.

"Most major players stop at identifying technical risk. But that's where we begin. They surface CVEs, alerts, protocol anomalies and misconfigurations, while at Centrii, we convert these into financial energy risk.

"We see Centrii as the central sentinel for industrial systems. We don't speak 'red flags', instead we speak about MWh, uptime, compliance exposure and asset value. Where other security companies stop at risk detection, we quantify the economic consequence of energy disruption.

"Our mission to safeguard energy generation has never changed. What has evolved, is how we execute it. We moved from a services-led cybersecurity identity to a persistent intelligence layer embedded across operational portfolios:

- From isolated site monitoring to portfolio-wide correlation
- From reactive assessments to continuous baselining
- From SOC dashboards to board-level financial exposure visibility.

"Centrii is built on the heritage of our platform, previously known as CEntry and reflects our commitment to stand side-by-side with clients, protecting critical infrastructure. Above all, Centrii stands for trust, built on integrity and proven in action."

When you describe cyber risk as an operational threat, what's the most common "day-one" failure mode you see on renewable sites — loss of visibility, loss of control, safety trips, or something more mundane like remote access gone wrong?

"The most common day-one failure mode is remote access gone wrong amplified by poor visibility. It's not advanced zero-days or cinematic cyber events. It's usually a number of issues including unmanaged OEM VPN tunnels, cellular routers deployed with default configurations, shared credentials across inverter fleets, flat internal segmentation and no east-west visibility inside the site.

"When something goes wrong, this is when energy operators discover they never had true Layer-2 or flow-level awareness to begin with. We've been saying this for years.

"The Poland wind turbine incidents are a clear example; router hijacking and remote manipulation made possible because connectivity existed without adequate operational visibility. Once edge routers were compromised, attackers could influence dispatch and control layers downstream. This is not a sophisticated espionage story; it is basic connectivity risk compounded by weak monitoring.

"The pattern is consistent across the sector with too much trust in vendor connectivity and limited insight into internal OT communications. But also, there's no financial mapping of what disruption would actually cost.

"Failure is rarely a catastrophic exploit on day one. It's accumulated blind spots that eventually become major operational exposure. In distributed energy, visibility is not optional. Without it, decentralisation becomes decentralised risk."

In practice, which operational KPIs do you map cyber risk to first — availability, curtailed output, balancing penalties, maintenance windows, safety exposure, or grid-code compliance?

"At Centrii, we start with availability, curtailed MWh, dispatch integrity, PPA downtime penalties, and warranty-impacting hardware damage.

"Because in renewables, compromise doesn't look like data theft; it looks like 30 wind turbines misbehaving simultaneously, protection logic altered, firmware overwritten, configuration wiped and remote access hijacked. When that happens, the first measurable consequence is not an alert, it's lost power.

"In Poland, publicly the discussion focused on "router hijacking". But the real issue was loss of visibility and control across decentralised assets. When a wind fleet is scattered across hundreds of square



RAFAEL NAREZZI,
CO-FOUNDER, **CENTRII**



kilometres and visibility is weak, a compromise can scale silently.

"For renewables operators, the KPI is simple: How many MWh can be disrupted before anyone notices? This is the metric that boards should be tracking."

A customer told you the real differentiator is translating technical risk into something that resonates with the C-suite and aligns with operational and regulatory realities. What did you have to change — in product design and in your sales motion — to make that translation reliable, rather than subjective?

"We stopped speaking in cyber language – no more CVEs or red flags. Instead, we map energy-specific criteria, like site capacity (MW installed), dispatch dependency, remote access exposure, firmware integrity risk, and recovery time after configuration wipe. Then we model PPA downtime penalties, balancing deviation costs, O&M escalation and hardware replacement due to warranty voiding.

"This is because malware that wipes a turbine configuration doesn't just create a cyber issue, it creates a whole host of other issues, including recommissioning delays, disputes with OEMs, hardware replacement costs and contractual arguments over who owns the damage.

"This effectively moves the conversation from 'threat likelihood' to operational consequence."

You've also linked cyber risk to financing, insurance, and asset valuation. Where are you seeing that show up first — in lender due diligence, insurance underwriting questions, M&A, or something else?

"Not in insurance initially, but in three key areas:

- PPA structures: Operators are realising that a cyber-induced outage is operational downtime, even if no physical damage occurred.
- Grid balancing penalties: If dispatch is manipulated or unstable, imbalance penalties accumulate quickly.
- Warranty disputes: When firmware or configurations are altered by malicious activity, OEMs may argue that it's down to improper handling or unsupported access paths. That's where the financial tension begins."

In real deployments, where does integration typically break first? OEM boundaries, network segmentation, data quality, or ownership confusion between asset owner, operator, and maintenance partners?

"Decentralisation changes everything. Renewables are not centralised power plants, but are highly distributed, remotely operated and often unmanned. They are also dependent on cellular or internet backhaul, and more important, they are managed by layered third parties that scale, which creates systemic fragility.

"What the industry underestimates is that small assets multiplied by thousands become major critical infrastructure. We are not talking about one turbine, we are talking about hundreds of turbines and thousands of inverters, as well as entire BESS fleets, remote telemetry nodes and cellular routers.

"The Poland situation showed something deeper: Visibility gaps + decentralisation = stealth compromise. You can lose control gradually across a fleet without triggering a dramatic event. That's far more dangerous than a visible outage."

Which specific OT touchpoints are expanding fastest — inverter fleets, BESS control stacks, wind turbine remote connections, third-party telemetry, or cellular backhaul — and which are most consistently misconfigured?

"In terms of what's expanding fastest and most exposed, I would say there are three areas. First, cellular backhaul and routers are often misconfigured, often unmanaged and often forgotten after installation.

"Second, wind turbine remote channels with OEM access paths that are assumed to be secure but rarely continuously monitored.

"Finally, BESS dispatch stacks with software-defined assets capable of injecting or withdrawing large volumes of power. The misconfiguration pattern is consistent – default credentials, flat networks, no east-west monitoring and no firmware integrity validation."

When we think about resilience and recovery, what can you genuinely automate in an OT incident without creating new risk, and what still requires human judgement because of process safety and restart sequencing?

"Human engineering judgement remains critical in recovery. Automation reduces detection time, but it cannot replace operational control.

"So, you can automate things like baseline learning of normal dispatch behaviour, detection of abnormal control commands, segmentation enforcement, remote access revocation, and also alerting on configuration drift. But what you cannot automate are restart sequencing, turbine recalibration, grid synchronisation, and protection relay verification."

Compliance is becoming an increasingly important and complex factor. When operators try to run one common rulebook across regimes like NERC CIP, IEC 62443, and emerging regional expectations, where do they get caught out — scoping, audit evidence, control ownership, or terminology mismatches?

"Renewables is one area where they are likely to get caught out. The trap is in assuming that because renewable energy sources are "not traditional utilities", they are lower risk. This is a mistake and the Poland situation disproved that narrative. The mistake was in treating decentralised assets as edge systems and failing to define cyber system boundaries properly, but also in assuming OEM responsibility equals operational security.

"Scoping is where most errors begin. If you scope wrong, you defend wrong."

What's the misconception you most often have to correct when renewables organisations move into US markets, especially around what ends up in-scope and where compliance effort gets wasted?

"Many renewable operators assume that if they are not classified as bulk electric assets, their exposure is lower. This is a mistake. In a decentralised grid, distributed energy resources (DER) aggregation, BESS balancing and remote dispatch integration create new forms of grid influence. Regulatory classification does not reduce operational risk or systemic impact, it only changes how oversight is applied. The compliance effort gets wasted when organisations scope to regulatory definitions instead of scoping to operational reality."

Some competitor brands in the space are often viewed as analyst-first platforms. Where do you deliberately not go deep and where do you still need specialist analysts in the loop because executive-friendly can tip into oversimplified very quickly?

"We deliberately avoid oversimplification for a start. We don't pretend that executive dashboards replace engineering strength in depth. We believe that you still need people like OT protocol specialists, firmware analysts, control engineers and incident responders. Executive clarity must sit on technical rigour; otherwise, resilience simply becomes marketing."



Looking ahead 12–24 months, which part of the decentralised energy stack is most likely to produce the next ugly surprise for operators, and what should they be doing now if they want to avoid learning that lesson the expensive way?

"The next 'ugly surprise' will be in distributed dispatch orchestration as fleets become software-coordinated with Virtual Power Plants, aggregated DER and AI-driven load balancing. If that orchestration layer is compromised, the impact will not just be one site, but regional instability. Poland was a warning. While 30 turbines were visible, many more compromises remain invisible.

"The real risk in renewables is not dramatic ransomware. It is quiet loss of control across decentralised assets, until the scale becomes systemic. Renewables tend to be underestimated because they look small, but multiplied, they become grid-scale influence.

"The question is no longer 'can a turbine be hacked' but 'how many distributed assets can be influenced before we notice?'."





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