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Extending Pulverized Coal Boiler Tube Life

By Dave Simcox, Director of Technical Sales –
Power Generation, IGS

How advanced thermal spray
cladding mitigates corrosion,
erosion, and costly tube
replacements in PC-fired
boilers.



Before HVTS cladding



After HVTS cladding

The Wall Blower Corrosion Cycle

The sequence repeats after every cleaning cycle until the substrate is isolated



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Extending Pulverized Coal Boiler Tube Life

By Dave Simcox, Director of Technical Sales – Power Generation, IGS

Extending the operating life of a pulverized coal (PC) boiler requires careful management of its pressure parts. Corrosion and erosion progressively reduce tube-wall thickness, increasing the risk of failures, forced outages, and costly panel replacement. Protecting tubes while they remain suitable for service can help preserve existing assets throughout an extended operating period.

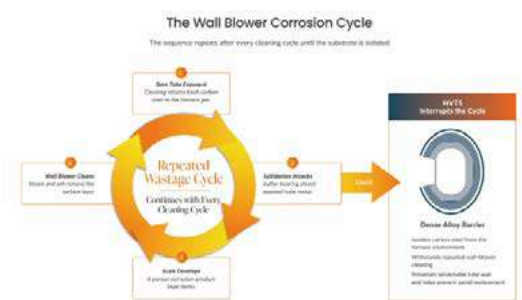
The starting point is to understand what is causing the damage. Different areas of the same boiler can experience different mechanisms, so the protection system must match the local operating environment. Two utility boiler examples show how this approach supports water-wall preservation, from long-term testing to protection expanded over successive outages.

Understanding the damage

PC boiler tubes can suffer from reducing-atmosphere fireside corrosion, coal-ash corrosion, fly-ash erosion, and damage associated with wall blowers or sootblowers. Fuel chemistry, combustion conditions, ash loading, gas velocity, and cleaning practices influence where and how quickly metal is lost.

In reducing furnace conditions, sulfur-bearing species can attack carbon-steel waterwalls and form iron-sulfide-rich scales that provide limited protection. Low-NO burners and staged combustion can contribute to these conditions.

Blower activity can intensify the problem. Cleaning removes the corrosion-product layer, exposing fresh tube metal to the furnace environment and allowing the corrosion cycle to restart. Mitigation must therefore provide a corrosion barrier durable enough to withstand repeated cleaning. Blower alignment, pressure, and operating frequency should also be reviewed.



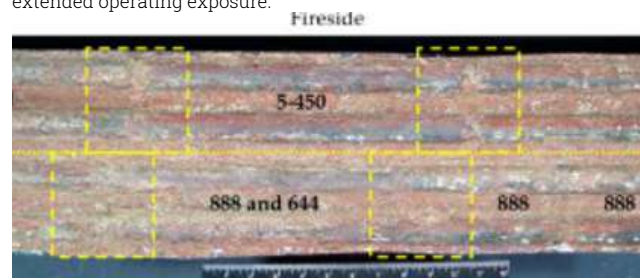
The wall-blower corrosion cycle repeats until HVTS alloy cladding interrupts exposure of the carbon-steel substrate.

Inspection should combine operating history, visual examination, ultrasonic thickness mapping, and, where appropriate, deposit analysis. Tubes below the plant's allowable minimum wall thickness, or with unacceptable cracking, require repair or replacement. HVTS alloy cladding protects remaining serviceable metal; it does not restore pressure-boundary thickness or repair structural cracks.

Case study: five years in a 1,300 MW boiler

A US utility owner and the Electric Power Research Institute (EPRI) evaluated thermal-spray materials in a 1,300 MW supercritical PC boiler operating with low-NO burners and reducing-atmosphere fireside corrosion.

Test panels containing IGS HVTS alloy cladding and products from another thermal-spray provider were installed adjacent to the burner elevations. This placed the materials in the furnace environment where protection was needed, allowing their performance to be assessed after extended operating exposure.



Tube-panel evaluation map used to compare material performance after long-term exposure.

Following five years and approximately 39,000 operating hours, IGS HVTS showed no visible deterioration. Examination recorded a maximum measured loss of less than 0.007 inches beneath the IGS HVTS alloy cladding. Other thermal-spray products tested experienced cracking and delamination.

The significant result was preservation of the underlying pressure-part material. Surface appearance alone cannot establish whether a protection system has performed its intended function; the condition of the tube beneath it is central to evaluating life-extension potential.

This evaluation provides long-term field evidence for protecting serviceable waterwalls exposed to reducing-atmosphere fireside corrosion. It also demonstrates why material selection should consider the performance of the complete installed system, including its ability to maintain an effective barrier throughout prolonged furnace exposure.

Case study: protecting waterwalls over successive outages

At another site, waterwall tubes above the burner elevations and below the over-fire-air ports experienced fireside corrosion following the installation of low-NO burners. Sootblower activity worsened the damage.

The location and operating history pointed to interacting corrosion and cleaning-related mechanisms. Repeated removal of the surface scale exposed the tubes to further attack, making protection of the remaining serviceable waterwall material a priority.

IGS installed bands of HVTS alloy cladding around the furnace and expanded the protected zones during successive outages. The dense, low-permeability alloy barrier isolates the carbon-steel substrate from the corrosive furnace environment.

The program's objective is to preserve the original waterwalls, reduce exposure to forced outages, and prevent panel replacement in the cor-

rosion zones. Expanding protection during successive outages allows the utility to address affected areas as part of its ongoing maintenance program.

This application illustrates the importance of evaluating fireside corrosion and blower-related damage together. Selecting protection for only one mechanism could leave the tube vulnerable to the other.



Left - waterwall tubes before surface preparation and the alloy upgrade. Right - waterwall tubes after installation of 5450 HVT alloy cladding

Matching protection to the application

The alloy system must suit the dominant degradation mechanism. A dual cladding system is available for waterwall applications in severe corrosion and erosion environments. Where both mechanisms are significant, a corrosion-resistant underlayer with an erosion-resistant outer layer can be applied.

Application quality is equally important. Substrate acceptance, surface preparation, controlled application parameters, qualified operators, and inspection all influence performance. Final records should document protected areas and support inspection during future outages.

Conclusion

Boiler tube life extension starts before metal loss makes replacement unavoidable. By identifying the damage mechanism, confirming that tubes remain serviceable, and applying the appropriate alloy upgrade, utilities can protect existing pressure parts and reduce the risk of premature panel replacement.

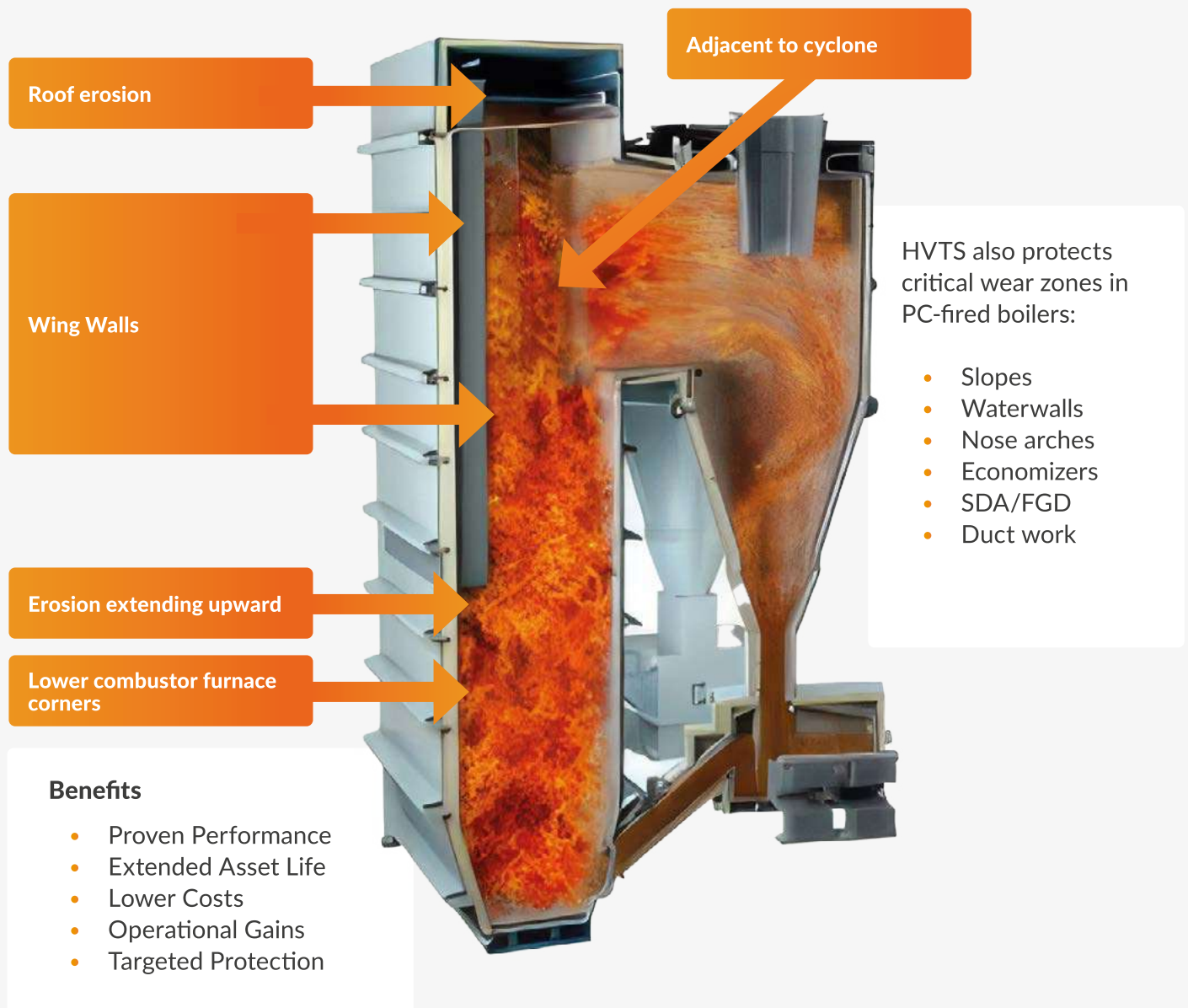
The long-term evaluation and staged waterwall application demonstrate the value of combining field evidence with a maintenance strategy tailored to the boiler. Continued inspection remains essential to managing those assets throughout their service life.





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Pepperl+Fuchs Introduces New Industrial-Grade Ruggedized Tablet Series

The Tab-IND series complements the Pepperl+Fuchs enterprise mobility portfolio with rugged industrial tablet solutions for intralogistics, the manufacturing and automotive industries, and field applications.

Pepperl+Fuchs, specialist for enterprise mobility solutions for industrial hazardous and non-hazardous areas, is introducing its new Tab-IND series of tablets with 8 and 10-inch displays for industrial use, leveraging its expertise in hazardous areas requirements. The rugged devices are protected against dust and spray water according to IP65.

The Tab-IND series is designed for applications in industrial environments where mobile devices are subjected to harsh conditions and where a long service life and flexible customization options are required – such as in intralogistics, manufacturing, or the automotive industry. The Tab-IND's extensive range of accessories and available interfaces allow the tablet to be customized for specific application needs.

The tablets ship with Windows 11 or Android 15 (10-inch model only), but are also available with a ThinClient. Bright displays with up to 700 cd/m², stylus and glove support, and an operating temperature range of -20 °C to +50 °C enable use in harsh industrial and outdoor environments. All variants feature a 13-megapixel main camera. The Windows models are additionally equipped with a 13-megapixel front camera, while the Android version features a 5-megapixel front camera.

Connectivity is ensured by the latest mobile and communication standards such as Wi-Fi 6E, Bluetooth 5.3 BLE, 5G, or LTE. A front-facing NFC module supports, among other things, access and identity controls for restricted areas. In addition, Push-to-Talk over Cellular enables fast and easy voice communication for groups over cellular networks, while a freely programmable button and a fingerprint sensor ensure flexible use and secure authentication.

With a quad-core processor, up to 16 GB of RAM, and up to 256 GB of internal storage, the tablets are ideally equipped for modern augmented reality and extended reality applications. The removable battery with a capacity of 37.2 Wh provides up to 14 hours of runtime. Weighing just over 500 grams (8-inch) or just over 800 grams (10-inch), the tablets are also slim and lightweight.

SmartBacks expand the range of functions

To expand the Tab-IND series, Pepperl+Fuchs offers various SmartBacks. These are attached to the back of the tablets and expand the range of functions depending on the application. Additional batteries to extend runtime or special mounts can also be added as SmartBacks

to the back of the device. Custom extensions based on SmartBack technology are also possible, such as for communication interfaces like Industrial Ethernet or IO-Link.

Among other things, a scanner frame is available for barcode scanning, for tracking shipments, or for picking materials or goods to support efficient intra- and transport logistics processes.

Additional accessory solutions are available, such as vehicle mounts, anti-theft devices, rugged frames for increased durability, charging stations with multiple charging bays, or a mount/single bay. The devices are charged via durable contacts on the underside, which are particularly long-lasting. An IO dock for use with external devices and displays is also available, making the tablet an alternative to a stationary office PC.

Kiosk terminals for industrial environments

As additional variants, Pepperl+Fuchs offers two kiosk terminals in 15-inch and 22-inch display sizes. They are suitable, for example, for access control, as information displays, or for digital workflow interactions. Both sizes are equipped with Android 15, 8 GB of RAM, 128 GB of internal storage, and a front-facing NFC module. The 22-inch terminal features a 13-megapixel front camera, while an optional 5-megapixel front camera is available for the 15-inch terminal.

European development and local expertise

The new devices complement the existing ultra-ruggedized portfolio of tablets from the Tab-Ex® series and smartphones from the Smart-Ex® series for hazardous areas. Development and design incorporated Pepperl+Fuchs' expertise as a global market leader and trusted advisor for the most demanding solutions and applications in hazardous areas, leveraging global supply chains.

Pepperl+Fuchs places special emphasis on European development and design to address the specific challenges faced by industrial companies. This means that companies can not only choose between different display sizes but also expect long-term device availability (at least five years) and software updates.

True to the motto "Global but Local," Pepperl+Fuchs, as a family-owned German company, offers its customers comprehensive service through its local branches in the respective local language. Especially for companies that use tablets in both hazardous areas and simply harsh environments, it is advantageous to be able to source all devices from a single provider.

A strong partner for every task

With Pepperl+Fuchs, customers benefit from a comprehensive portfolio and years of experience, not just in hazardous areas. Mobile devices, HMI solutions, and a wide range of process-oriented devices and sensors come together perfectly to form a broad offering for any automation and digitalization requirements. Mobile workers can integrate additional solution packages from a single source, such as Pepperl+Fuchs data collection, measurement, and monitoring devices, headsets, or Auto-ID.

About Pepperl+Fuchs

As one of the leading companies in the automation industry, Pepperl+Fuchs is considered a pioneer in its markets worldwide with groundbreaking technologies. For conventional and future applications, the company based in Mannheim, Germany, offers a comprehensive portfolio for factory automation and for the process industry. At the same time, Pepperl+Fuchs is constantly advancing pioneering technologies and thus paving the way for its customers to meet the coming challenges of Industry 4.0.

www.pepperl-fuchs.com



Enerpac Launches Armor Stack Modular Tool Storage And Deployment System

Industrial hydraulic tools specialist, Enerpac, announces Armor Stack, the first heavy-duty tool storage platform that combines military-rated protection in a fully modular, stackable system. Developed by Enerpac, it delivers the rugged durability needed to protect valuable hydraulic tools while giving users the flexibility to organise, transport, and deploy tools more efficiently.

Until now, companies deploying maintenance and construction teams across multiple sites have faced significant logistics and practical challenges. Traditional heavy-duty toolboxes operate as standalone units; Armor Stack changes the model, allowing multiple cases to lock, stack and deploy as a single integrated system. This enables teams to create scalable, job-specific tool configurations required for each application. The result is faster deployment, better organisation and greater flexibility in the field, while securely keeping critical hydraulic tools together and ready for use in the toolbox's pre-cut foam interiors.

Armor Stack C8 Leads the Enerpac Launch

Enerpac launches Armor Stack with the medium-sized C8 configuration, providing customers with the full benefits of the modular, stackable system from day one. The Armor Stack ARMRC8 range of cases is available in five configurations: three hand pump kits, a 101 kN tonne hydraulic lifting kit, and a 101 kN hydraulic lifting kit with hand pump. In addition, an empty Armor Stack stackable case is available for storing existing tools.

For easier handling, the Armor Stack toolbox features over-moulded heavy-duty handles designed to provide a secure grip when lifting and moving equipment, helping teams transport their tools safely across workshops, plants and job sites. A separate wheel kit comprising two attachable wheels allows larger, heavier cases to be moved around easily. For stacked toolboxes, the Armor Stack range also includes a custom Enerpac trolley for ease of site deployment.

Further sizes and configurations are planned for future release, expanding the platform to meet a wider range of tool storage, transport and deployment requirements.

"Traditional heavy-duty toolboxes generally operate as standalone units, which limits flexibility on complex job sites," says David Proeber, Director, Strategic Growth + Innovation at Enerpac. "Armor Stack changes the paradigm entirely by bringing military-grade protection to a fully integrated, modular system. Every contour, latch, and handle was designed specifically around the real-world demands of field technicians and maintenance teams, delivering protection for high-value hydraulic assets and significantly streamlining site planning and logistics."

Modular, stackable tool storage system designed around the job

Armor Stack heavy-duty, industrial toolboxes are engineered to withstand the rigours of real-world industrial use. Every Armor Stack case is validated against Military Standards MIL-STD-810-H, ensuring the C8 cases are resistant to harsh environmental stresses like drops, extreme temperatures, and vibrations. They are also ATA 300 specified and IP67 validated, protecting high-value, sensitive tools against dust and water immersion.

Armor Stack utilises an integrated metal latching system that allows multiple cases to be securely locked, stacked, and transported as a single tower unit weighing up to 226 kg. Reinforced, padlockable security points provide additional protection during storage and transit, while wind-resistant hinged lids help keep cases securely open during use.

By combining robust protection with a modular, stackable design, Armor Stack provides a new approach to transporting and deploying tools, helping teams arrive on site with the tools they need, organised and ready to work.

For more information on the Enerpac Armor Stack system, visit: www.enerpac.com



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Hart's Milestone Installation

With 20 Typhoon doors weighing over 60 tonnes for a Hebrides contract, Hart Door Systems of Newcastle upon Tyne is quite rightly celebrating an order which is the company's largest ever by total weight.

Nick Hart, Hart's managing director, advises the order involves various door sizes up to 8M in width and all being installed in a challenging, exposed, marine environment.

The Typhoon is rated up to 4Kpa (4000 pascals) wind resistance, this eclipses the BSEN 12424 class 5 which is tested to 1250 pascals. Mr Hart says: "We have increasing demand for this door, not surprising-

ly with global warming increasing the frequency and velocity of storm events.

Extreme wind pressure in a storm is one issue in areas naturally exposed directly to the sea, estuaries, hillsides. However, pressure can be increased by factors due to local topography and adjacent walls and or buildings.

This can be as a result of funnelling of the wind, opening of other doors in buildings and so on bringing an unforeseen pressure risk. The density of the air is another factor that needs to be considered at specification stage. Note that all pressure testing is static and does not reflect buffeting and gusting effects which is the reason for the higher safety factor of the design.

"Recent news advising of extreme typhoons in Asia, one such area is Hong Kong where we have installed Typhoon doors on a multi-story data centre in downtown Hong Kong, and on various Airport units." Hart Door Systems is Britain's foremost manufacturer of automatic high-speed doors and security shutters. Hart's chairman, Doug Hart, comments: "The heavy-duty construction of each Typhoon fully complies with British and European safety standards and will efficiently deliver performance for many years to come."

"With over 80 years of experience in industrial roller shutter doors, we have used our extensive engineering knowledge to design the Typhoon shutter to be strong and long-lasting.

"In-house design and testing allows Hart to vary the specification to encompass and comply with other standards. For instance Typhoon can be combined with the security rating LPS1175 to SR3 standard with manual or automatic locking and manual or automatic operation and speed enhancement for the smaller doors sizes perhaps more frequently operated.

"The Typhoon roller shutter is perfect for delivering security in areas exposed to extreme winds from tropical storms such as hurricanes, typhoons and cyclones.

"The door curtain profile is available in insulated or non-insulated Steel, stainless steel profiles, optionally galvanised, powder coated or pre-finished plastisol coatings."

Mr Hart concludes: "Hart's Roller shutter doors are backed by Hart's over 80 years' experience in roller shutter door systems.

"We confirm their design and construction of their many models are suitable for all door openings and with options and specific requirements of interface, automation, speed, safety will efficiently deliver performance for many years."



Enerpac Announces New Tandem E-Mover Skates For Synchronised Positioning Of Bulky Heavy Loads

Enerpac Heavy Lifting Technology has expanded its E-mover skates portfolio with the introduction of the Tandem E-Mover EMLSD25. Operating in tandem pairs, the E-movers are synchronised into a single coordinated system for moving and positioning heavy and bulky loads in confined, low-clearance environments.

At the core of the new E-mover is Enerpac Sync-Drive technology. It utilises a camera-based 360° angle and lifting stroke detection alongside real-time, inter-unit communication across up to four E-Mover EMLSD25s, allowing the E-mover skates to communicate and operate as a unified, highly coordinated transport platform.

"The E-mover EMLSD25 skate enables safe, precise horizontal positioning of large, bulky equipment within confined industrial environments with unmatched control and safety," says Carsten Daft, Senior Product Manager, Enerpac Heavy Lifting Technology. "Capable of scaling capacities up to 800 kN (80 tons), the integrated E-mover skate features a compact chassis housing drive, steering, lifting, control electronics, and efficient lithium battery power management."

Advanced Operator Control

The EMLSD25 skate incorporates an integrated 70 mm hydraulic lifting cylinder, enabling operators to safely lift and align loads without high-risk vertical lifting. The remote-control interface features a high-visibility colour display providing live telemetry, including real-time sensor values, load balance, traction, lifting height, and system diagnostics. Battery-powered, the zero-emission EMLSD25 operates quietly with approximately four hours of runtime and fast-recharge capability.

The complete Enerpac E-Mover EMV80SD system includes two E-Mover EMLSD25 skates, two MLSR20B100 follower skates and two remote controls. Operators have the option to use either a single E-mover for smaller jobs up to 500 kN (50 tons) or synchronise both E-movers to increase capacity up to 800 kN for larger, bulkier moves. When using

two E-movers, the second remote control provides a monitoring and safety function, for example, when the load obscures the view of the main remote control operator.

Precision Manoeuvrability

Preset functions align multiple E-Movers to a shared coordinate system enabling synchronised tandem movement. In addition, lifting controls are integrated with movement controls for safe incremental raising or lowering of loads with continuous monitoring feedback.

Equipped with dual electric drive motors, gearboxes, and multi-steering modes including zero-radius turning, carousel, crab, and dual-axis steering the EMLSD25 skate can navigate restricted workspaces with extreme precision. Safe operation is built in. Shared safety logic continuously monitors the EMLSD25 skate operating parameters, issuing automatic warnings or halting movement if parameters are exceeded.

For more information on the Enerpac E-Mover EMV80SD system, visit www.enerpac.com



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When working between both indoor and outdoor spaces, having the right systems and solutions can help alleviate these day-to-day physical challenges, reduce risk of injuries or accidents, and keep operations moving. From the facilities and storage yards of building materials distributors, and manufacturers to docks and terminals, the right solutions prepare teams to reduce risk, increase comfort, and enhance productivity.

1. LIGHTING TRANSITIONS

Switching from bright outdoors to dimmer indoor spaces, can cause visibility issues that raise the risk of mistakes or slowdowns. Lights can be mounted on the forklift cab or directly on the mast to avoid casting shadows that interfere with the operator's view.

2. VARIED GROUND AND DEBRIS

Moving from pavement to gravel to flat flooring, and over ramps, thresholds like steel plates or scattered debris, can risk operator discomfort. Forklifts with increased ground clearance can help operators clear difficult terrain. Belly pans can be bolted onto the undercarriage to help prevent debris from flying up into the truck.

A full- or semi-suspension seat can help minimise body vibration to reduce operator fatigue, and hydraulic accumulators can act as a shock absorber, reducing vibration experienced by the operator.

3. UNPREDICTABLE ENVIRONMENTS

Different environmental factors like tractor-trailer diesel fumes, temperature shifts, wind and moisture can take a toll on operators and equipment. Windshield wipers can help clear away rain and debris for greater operator visibility. An overhead guard cover, either shaded or UV-protected, provides coverage from the sun. Enclosed cabs can keep sun, rain and snow off operators while enabling temperature control and helping to block out harsh smells.

4. UNUSUAL LOADS

In many facilities, particularly in the manufacturing and logistics industries, loads can come in a variety of shapes, sizes, and weights. Forklift attachments like side-shifting fork positioners can help reduce effort and increase operator confidence handling a wide range of pallets and loads.

5. NOISE

Operators are already busy managing heavy equipment and staying alert in fast-paced settings. Sudden changes in noise, like from a loud facility to a quiet yard, can disrupt their focus. Many forklifts can be equipped with sound absorbing material in the underside of the floor plate, inside the dash covers, inside the side panels and inside or under the hood. Electric-powered forklifts generally run quieter than their internal combustion counterparts, cutting down on noise around the operator.

6. TIGHT SPACES

Close quarters inside the back of trailers can make it difficult for operators to manoeuvre equipment, get clear sightlines, and handle loads efficiently. Short forklift masts can give operators a clearer view over the top to limit the need to crane their necks and can help reduce risk of the mast striking the top of the trailer. Swivel seats can help operators pivot and get a better view of their surroundings without constant neck craning.

To learn more, contact your local Hyster dealer or visit [Hyster.com](https://www.hyster.com).



Pipe Dreams Become A Lifting Reality With Turnkey Hoist & Winch Package

For a UK-based manufacturer of plastic pipe systems, flexibility is essential when handling large-section pipework and the customised angle and bend connections required by end customers. To support final assembly operations,

Hoist & Winch Ltd has supplied and commissioned a turnkey package of eight aluminium mobile gantry cranes offering 2-ton safe working load (Swl), each equipped with a 110V single-phase electric chain hoist.

The equipment is installed in a dedicated section of the manufacturer's final assembly area, where pipe sections – used to protect electrical cables – are fitted with angle and bend connections.

The company supplies customers across a wide range of industries, including the growing datacentre sector. Flexibility was therefore a key consideration in the specification. Manufactured by Reid Lifting, the aluminium mobile gantries supplied by Hoist & Winch feature adjustable height and span width, allowing the configuration of each crane to suit the available workspace and the dimensions of the pipes that require handling.

With a maximum working hook height of 6 metres and bridge span of 4 metres, the cranes provide sufficient capacity and reach for the largest pipe sections currently processed by the company. They also offer an element of future-proofing should the manufacturer introduce larger sections.

Mobility is another critical feature. Each gantry features large pneumatic-tyred wheels, making the cranes easier to manoeuvre while improving stability when travelling under load. This capability is particularly useful when moving across raised cable ramps or small floor imperfections.

The four wheels incorporate 360-degree swivel action with directional locking at 90-degree intervals, providing operators with further flexibility when positioning the gantries. Once correctly positioned over the workstation assembly jigs, manually operated heavy-duty parking brakes securely hold each crane in place. Here, the lifting systems play a vital role in the assembly process, safely supporting pipe sections while angle or bend connections are fitted and adhesives are allowed to cure.

"It's a deceptively demanding application because the lifting equipment needs to combine substantial capacity with the freedom to move around the assembly area," explains Hoist & Winch Director Andy Allen. "The aluminium gantries give the customer that flexibility, while the 2-ton Swl hoists offer the reliable lifting performance needed for these large and varied pipe sections."

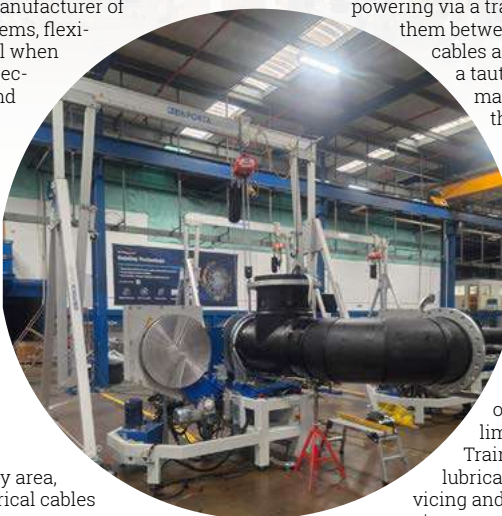
To provide effective and electrically safe lifting within the assembly environment, Hoist & Winch installed heavy-duty 2-ton Swl Yale/Loadstar 110V single-phase electric chain hoists. The low-voltage supply is particularly appropriate because the gantries require

powering via a trailing floor cable as the company moves them between workstations. Hoist and pendant control cables are managed across each crane bridge using a taut-wire festoon catenary system, helping to maintain orderly cable routing while allowing the hoists to travel along the bridge.

Following installation, Hoist & Winch completed LOLER (Lifting Operations and Lifting Equipment Regulations) inspection and testing of each complete lifting system and issued the appropriate LOLER Thorough Examination reports, providing complete peace of mind for the customer.

On-site operator training covered equipment functionality, hoist components and operating controls, including top and bottom limit switches and emergency-stop functions. Training also addressed periodic checks and lubrication, together with annual inspection, servicing and certification requirements. Each operator was given practical experience in using the equipment, ensuring safe and effective operation of the new lifting systems from day one.

Visit www.hoistandwinch.co.uk for further information and to view recent case studies.



Detecting Power-Supply Problems Before They Cause Industrial Control-System Downtime

By Steven Zhang, Product Manager, Powernexu Technology Co Limited

Power-supply failures in industrial control systems are often treated as sudden events. In practice, many failures develop gradually through rising temperature, ageing components, restricted airflow, increasing load or deteriorating connections.

For maintenance teams, the challenge is identifying these warning signs early enough to act before a power problem stops a PLC, industrial PC, I/O system or communications network.

The power supply should therefore be treated as a maintainable asset rather than a component that is replaced only after failure.

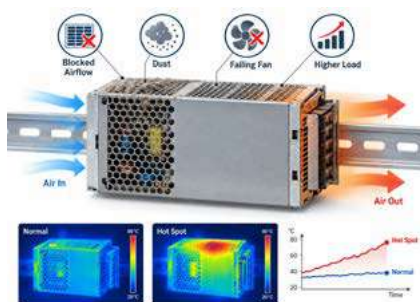
Temperature Is Often the First Warning Sign

Heat accelerates stress on many PSU components, including electrolytic capacitors, semiconductors, connectors and cooling fans. A rising PSU temperature does not automatically mean failure is imminent, but a change from the unit's normal thermal pattern can be useful maintenance information.

Engineers should monitor the actual air temperature entering the PSU rather than relying only on the temperature of the room or control cabinet.

Blocked filters, dust accumulation, failed fans and cable congestion can all reduce effective airflow.

Thermal imaging can also help identify unusually hot connectors, terminals or sections of the power supply.



A useful maintenance practice is to compare temperatures under similar machine loads. A PSU that operates noticeably hotter than it did several months earlier may deserve further inspection even if its output voltage is still within specification.

Load Growth Can Reduce Reliability Margin

Industrial systems rarely remain unchanged throughout their lifetime. Additional sensors, I/O modules, communication devices, industrial PCs or auxiliary equipment may be added without reviewing the original power budget.

The PSU can therefore move gradually from moderate utilisation toward continuous high load.

This reduces the available margin for:

- Startup current
- Temporary overloads
- Higher ambient temperature
- Component ageing
- Future expansion

Maintenance teams should periodically compare actual current or power consumption with the PSU's rated capability and the manufacturer's derating limits.

A supply that was comfortably sized when the machine was commissioned may no longer have the same margin several years later. Voltage and Fault Trends Can Reveal Developing Problems. A single output-voltage measurement provides only a snapshot. Trend information is much more useful.

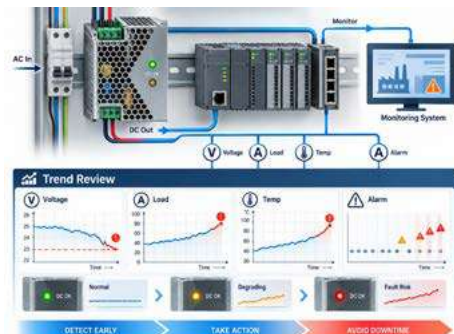
Where monitoring is available, engineers should watch for changes in:

- Output voltage
- Output current
- PSU temperature
- Fan speed
- Input voltage
- Warning or fault status
- Redundancy status

Repeated undervoltage warnings, temperature alarms or brief protection events should not simply be cleared and forgotten. They can indicate increasing load, poor cooling, unstable input power or a developing PSU problem.

Modern digitally managed supplies may provide telemetry through interfaces such as PMBus, while simpler industrial PSUs may provide DC_OK, alarm contacts or status signals.

Even basic signals become valuable when maintenance teams record and trend them over time.



Connections Deserve Attention Too

Not every "power-supply failure" originates inside the PSU. Loose terminals, oxidised contacts, damaged connectors and poorly terminated cables can increase resistance and create local heating. At higher current, a small resistance increase can produce significant

temperature rise.

Inspection should therefore include the complete power path:

AC input - PSU - distribution terminals - DC cabling - control equipment

Discolouration, damaged insulation, unusual connector temperature or repeated voltage drop under load can all indicate a connection problem.

Redundancy Creates a Maintenance Opportunity

Redundant power architectures can reduce downtime, but only if both power paths are healthy.

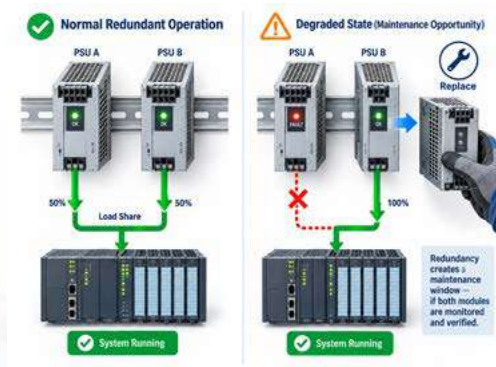
A common risk is that one redundant PSU fails silently or remains in a warning state while the system continues operating normally on the remaining unit.

The apparent redundancy has then disappeared.

Maintenance teams should periodically confirm:

- Both modules are online
- Current sharing is reasonable
- No persistent fault is present
- Both input feeds are available
- Hot-swap replacement works as intended

When redundancy is healthy, a deteriorating PSU can often be replaced during planned maintenance without shutting down the control system.



Move From Reactive Replacement to Condition-Based Maintenance
The goal is not to replace power supplies unnecessarily.

It is to combine simple indicators—temperature, load, voltage, alarms, airflow and connector condition—to identify units whose operating behaviour is changing.

A practical maintenance routine can include:

- Periodic thermal inspection
- Cleaning filters and airflow paths
- Recording PSU load
- Reviewing alarms and telemetry
- Checking redundant modules
- Inspecting high-current connections
- Planning replacement when multiple warning indicators appear

Power supplies are critical to every electronic control system, yet they are often ignored until a failure occurs.

By monitoring how a PSU behaves over time, maintenance teams can turn many power failures from unexpected production events into planned service activities.

Author Bio

Steven Zhang is Product Manager at Powernexu Technology Co Limited, focusing on server and industrial power supplies, redundant power architectures and power-system integration. His work covers power-delivery reliability, thermal performance and high-density computing and industrial control applications.

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Maintenance as a Profit Center: A Practical View for Small Manufacturers

A machine at DeKing Precision caught fire. The fire suppression system did its job, but refilling it cost thousands of dollars. Then it happened again. When the team finally traced the cause, they found clogged oil lines and metal chips packed into the hoses — the kind of thing a simple recurring check would have caught.

That is the story small manufacturers know all too well, even if the details differ. A missed preventive maintenance task doesn't look serious today. But when a shop is already running lean, it doesn't stay small. It can become downtime. Downtime can become a late order. A late order can become a lost customer. And poor maintenance documentation can put vendor status at risk.

That is why maintenance can no longer be treated only as a cost. It is a profit center — not because maintenance creates revenue on its own, but because it protects the revenue a shop has already sold. When machines run, jobs move. When jobs move, customers get parts on time. And when customers get parts on time, trust — and revenue — stay protected.

The Real Problem Isn't Effort — It's Scattered Information

After speaking with more than 200 small manufacturers across the United States, one pattern showed up again and again: these shops were not ignoring maintenance. They were busy, practical, and doing the best they could with the tools on hand — whiteboards, spreadsheets, binders, OEM manuals, clipboards, ERP notes, and a lot of tribal knowledge.

That works, until it doesn't. Until the shop gets busier. Until an audit date gets closer. Until a customer asks for proof. Until one missed task turns into a production problem.

The issue is rarely effort. It's that maintenance information lives in too many places at once — a task buried in a 300-page OEM manual, a service interval sitting in a binder, a machine's history living mostly in someone's memory, a compliance record nobody can find when an auditor asks for it. In a small manufacturing business, that kind of scatter turns into cost very quickly.

Most machines already come with the information needed to maintain them properly — it's built into the OEM manual. The problem is that the manual is long, technical, and disconnected from daily life on the shop floor. The requirements are correct; they just haven't been turned into scheduled tasks, assigned work,

completed records, and proof. Getting there doesn't have to be complicated: upload the manual, pull out the maintenance requirements, build the schedule, track the work, and keep the documentation. That's the foundation of a plan-first approach to maintenance.

As Greg Christensen points out, that foundation is really just the starting line: "You may then optimize preventive maintenance moving forward, for your specific machines in your environment, to go beyond the OEM maintenance specifications."

Why the Repair Bill Isn't the Real Cost

Every shop owner can see the cost of a breakdown — the part, the service invoice, the technician's time. The bigger cost is harder to see: delayed jobs, overtime, rushed parts, missed production windows, scrap, rework, frustrated customers, and in some cases, vendor status on the line.

That's why maintenance is better discussed in financial terms. The question isn't "how much does maintenance cost?" It's "how much revenue does maintenance protect?" For a small manufacturer, the answer can be significant.

A Real Shop's Maintenance Journey: DeKing Precision

DeKing Precision is a precision machine shop where uptime matters every day. As owner Dave DeVandry explained during a recent industry webinar, his shop had been struggling with production, machine performance, and maintenance consistency. His father, who had run the shop for decades, came in and quickly spotted the core issue: "My machines were not being maintained properly."

DeKing didn't need another complicated ERP module, or a tool too cumbersome for the team to actually use day to day. They needed something simple enough to implement and practical enough for the shop floor — a way to upload machine manuals, pull out the maintenance requirements, decide what applied, and get moving. Dave described the rollout plainly: "MROPLAN we implemented in two weeks."

As industry maintenance veteran Greg Christensen of CMMSradio often points out, this is where a lot of shops go wrong — treating a CMMS rollout as a software purchase instead of a change in process. Success isn't about the software alone; it's about people, process, culture, and adoption. A system only works if the team actually uses it, and it needs to fit the shop floor rather than the other way around.

That's exactly what played out at DeKing. The fire-suppression incident became part of the plan rather than a one-off scare — after the second event, the team built the oil-line and hose checks into their recurring maintenance schedule. As Dave put it: "You don't have to be perfect to start with. You're always going to make changes to this and make it better and better." That's what practical maintenance improvement looks like in practice — not a perfect system on day one, but a structure that helps a shop learn and adjust.



Scott Blanford - Co Founder MROPlan.ai



Dave DeVandry - President DeKing Precision Inc

Why Uptime Hits the Bottom Line Directly

For a precision shop, downtime isn't just an inconvenience — it touches production, quality, scrap, delivery, and customer confidence all at once. Dave put it directly: "We hold really tight tolerances. If my machines are not tip-top, then I'm not going to be able to hold that quality to my customers." And the financial impact follows close behind: "I'm losing money on scrap parts, I'm losing money on downtime, I'm losing money on having to sort through parts. It's a massive problem."

That's maintenance as a profit center in practice. It isn't just about keeping a machine clean or checking a box — it's about protecting production capacity, quality, delivery, and margin all at once. Compliance and Vendor Status

For many small manufacturers, maintenance documentation is increasingly tied to compliance — ISO, AS9100, customer audits, and supplier reviews are all becoming more common, even for smaller shops. The trouble is that many shops scramble when the audit shows up: pulling clipboards, updating spreadsheets, hunting for backup, trying to prove work that may have been done but was never properly recorded. Dave described the difference clearly: "Now I can show them MROPLAN and show them the maintenance that we're checking off." That matters because vendor status isn't only about making good parts — it's about proving the systems behind production are controlled, documented, and reliable. For small manufacturers, solid maintenance records can be the difference in protecting both customer confidence and supplier standing.

The Real ROI: Capacity, Not Just Repair Savings

Maintenance ROI usually gets framed as reduced repair cost, and that's part of it. But for small manufacturers, the bigger return is often reclaimed capacity. When machines are available, a shop produces more reliably. When production is reliable, revenue is protected. When delivery is reliable, customers stay confident.

To put rough numbers on it: a typical small-shop platform cost runs around \$20 per machine per month, and at an average of roughly 4.4 machines per plant, that's about \$1,000 a year. Against that modest cost, shops report a meaningfully larger reclaimable revenue opportunity from avoided downtime and protected capacity — the exact number varies shop to shop, but the principle holds. Downtime is expensive. Missed production is expensive. Lost customers and lost vendor status are expensive. Planned maintenance protects the revenue engine underneath all of it.

Five Practical Steps to Get Started

A small manufacturer can start improving maintenance without over-complicating the process:

1. List the critical machines in the shop.
 2. Collect what already exists — OEM manuals, SOPs, service notes, and any existing maintenance records.
 3. Identify the gaps — the preventive tasks and intervals that are currently missed or inconsistently tracked.
 4. Turn requirements into a schedule — assign tasks by machine.
 5. Keep proof that the work was completed.
- Once a shop has that structure in place, maintenance becomes easier to manage, easier to prove, and easier to connect to the bottom line.

Final Thought

The coming manufacturing boom will create real opportunity for small manufacturers — but it will also expose weak systems. A missed PM that looks harmless today can become downtime tomorrow. Downtime can become a late order. A late order can become a lost customer. And poor documentation can put vendor status at risk. Small manufacturers don't need maintenance software for the sake of software. They need a practical way to protect production, turn OEM manuals into action, stay ahead of breakdowns, and protect customer delivery and vendor status. That's the shift: stop thinking about maintenance only as a cost, and start thinking about it as a profit center. Stop managing work orders. Start managing plans.

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MROPLAN.ai webinar transcript: "Pasted text.txt" Used for Dave DeVandry / DeKing Precision examples, implementation comments, fire suppression story, tight tolerance comments, audit readiness discussion, ISO/vendor status discussion, and shop-floor workflow. Greg Christensen LinkedIn profile / uploaded source: "Profile (42).pdf" Used for Greg Christensen's CMMSradio role, CMMS SME positioning, a CMMS co-founder background, CMMS consulting background, and maintenance/facilities/SaaS expertise.

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John Gabriel - Founder MROPlan .ai

Greg Christensen

From P&ID to CMMS: Building the Maximo or SAP Asset Register

Muaawia Jannat: Founder, Tagsight Technologies Inc.

How P&ID tags become Maximo or SAP PM asset records, through functional locations, equipment masters, classification attributes, and the instrument index as the handover document.

A P&ID tag and a CMMS asset record describe the same physical device from two different disciplines, and the handover between them is where most maintenance data quality problems start. Building a clean Maximo or SAP PM asset register from a P&ID means translating each instrument and valve tag into a functional location, an equipment record, and a set of classification attributes the CMMS can actually use for planning, spares, and work history.

Done well, this happens once, during commissioning data handover, not repeatedly through years of maintenance tickets that reference a device nobody can find in the system.

Why the P&ID tag is not a CMMS asset number

An ISA 5.1 style tag such as PT-101 tells a process engineer three things: the measured or controlled variable (pressure), the function (transmitter), and a loop number that ties it to a control loop on the drawing. It says nothing about where the device physically sits in a plant hierarchy, what its maintenance strategy is, what spare parts fit it, or who is responsible for it. A CMMS does not organize the world by loop. It organizes by functional location (a fixed position in the plant hierarchy, independent of the device installed there) and by equipment record (the physical asset, which can be removed, replaced, or repaired without changing the functional location).

This is the core translation job. PT-101 on the P&ID becomes a functional location like AREA10-COMP-A-PT101 or 10-PT-101 depending on the site's numbering convention, and the physical transmitter installed there becomes an equipment record with its own serial number, manufacturer, model, and calibration history. If the transmitter is swapped out for a replacement unit, the functional location stays the same and a new equipment record is linked to it.

Sites that skip this distinction end up with asset numbers that are really just P&ID tags, which breaks the moment a device is replaced or a loop is renumbered on a later revision.

Tag to functional location, the mapping decisions that matter

Before any tags leave the P&ID, someone has to decide the functional location numbering scheme, because the CMMS structure will outlive several generations of drawings. The decisions that matter most:

- Hierarchy depth. Plant, area, unit, system, and loop, or a flatter structure. A refinery with dozens of units needs deep hierarchy; a single packaged skid usually doesn't.

- Numbering source. Some sites carry the ISA loop number straight into the functional location (cleanest, but only works if tag numbers are unique plant-wide). Others assign a separate CMMS-native number and cross-reference the P&ID tag as an attribute. Cross-referencing is more resilient to future P&ID renumbering but adds a lookup step for technicians.

- Multi-tag loops. A single control loop can include a transmitter, a controller function, and a final control element (PT-101, and the valve it operates, FCV-302, tied together on the same loop). Each physical device gets its own functional location and equipment record even though they share a loop number on the drawing.

- Non-instrument tags. Valves (XV-301), relief devices, and rotating equipment on the P&ID follow the same translation, and most CMMS asset registers actually contain more valve and mechanical equipment records than instrument records.

The mapping table below is the single most useful artifact in this phase, and it should exist as its own spreadsheet or database table before anyone starts creating records in the CMMS, not as tribal knowledge in someone's head.

What Maximo and SAP PM expect at minimum

The two dominant enterprise CMMS platforms use different vocabulary for the same underlying structure. Getting the terminology straight avoids a lot of confused handover meetings between the instrumentation team and the reliability team.

Concept	P&ID / ISA terminology	IBM Maximo	SAP PM (S/4HANA Asset Management)
Fixed position in the plant hierarchy	Loop / tag location on the drawing	Location (hierarchical, parent-child)	Functional Location (structured code, e.g. PLANT-AREA-UNIT-DEVICE)
Physical device that can be swapped	Instrument or valve body	Asset (linked to a Location)	Equipment (linked to a Functional Location, has its own master record)
Grouping devices by type for reporting and specs	Signal type / device category on the legend	Classification + Attributes (Ka specs)	Class + Characteristics (via classification system CL20N or object type)
Where calibration, PM plans, and work orders attach	Not on the P&ID	Asset or Location, depending on site config	Equipment master record (preferred, per PM best practice)
Spare part cross-reference	Manufacturer cut sheet, separate from the drawing	Item Master linked to Asset	Material Master linked to Equipment (bill of material, BOM)

In practice, every instrument and control valve on the P&ID needs, at minimum, a functional location code, an equipment record if the physical device is known at handover, and a classification that lets the CMMS group it with every other pressure transmitter or control valve in the plant for reporting and spares standardization.

Classes, attributes, and specifications

This is where most handovers lose data even when the functional location structure is sound. A CMMS classification for "pressure transmitter" or "control valve" carries a defined set of attributes, and those attributes have to come from somewhere concrete: the instrument index, the specification sheet, or the manufacturer's data sheet, rather than filled in from memory at data entry time.

For a transmitter like PT-101, the attributes a maintenance planner needs typically include: measured variable, range, output signal type, process connection size and rating, wetted material, hazardous area certification, and manufacturer part number. For a control valve like FCV-302: body size and rating, actuator type, fail action (fail open, fail closed, fail last), positioner type, and seat leakage class. None of this lives on the P&ID itself.

The P&ID gives you the tag, the service, and the loop context. The instrument index and the specification sheets give you everything the CMMS attribute fields actually need filled in.

A safety instrumented function tag such as SIF-101 carries an additional handover requirement: the CMMS record needs to reflect that this device sits inside a safety loop, because SIF and SIL-rated devices usually have a mandated proof-test interval and a documented test procedure that has to attach to the equipment record, not float in a separate safety file that maintenance never sees.

The instrument index as the handover document

The instrument index (sometimes an I/O list, sometimes a standalone spreadsheet) is the practical bridge between the P&ID and the CMMS, because it is already organized by tag with columns for service, range, signal type, and loop association. The columns a well-built instrument index needs to carry, specifically to support a clean CMMS load, are:

A P&ID review that produces this index directly, rather than as a separate manual transcription pass after the drawing is issued, removes one of the most common sources of tag mismatches between engineering documents and the maintenance system.

Instrument index column	Feeds this CMMS field
Tag number	Cross-reference on the equipment record
Functional location (if assigned pre-handover)	Functional Location / Location code
Service description	Equipment description
Manufacturer and model	Equipment master, manufacturer/model fields
Range and units	Classification attribute
Signal type (analog, discrete)	Classification attribute
P&ID drawing number and revision	Linked document reference
SIL or safety classification, if applicable	Safety-critical flag, proof test PM trigger

Where handovers usually break down

Three failure patterns show up repeatedly on brownfield and greenfield projects alike. First, tag renumbering between issued-for-construction and as-built drawings that never gets reconciled against the CMMS, so the maintenance system references a tag that no longer exists on the current P&ID. Second, instrument index columns that get filled in loosely at handover ("TBD" in the manufacturer field) and never get revisited once the plant is operating, leaving classification attributes permanently blank.

Third, valves and instruments that appear on the P&ID but were never assigned a functional location because they weren't considered

"critical" at the time, which then surface as unplanned, undocumented assets the first time they fail.

The fix for all three is the same discipline. Treat the instrument index as a controlled document that gets revised alongside the P&ID, and treat the CMMS load as a data migration project with a defined source of truth, not a one-time import that nobody owns afterward.

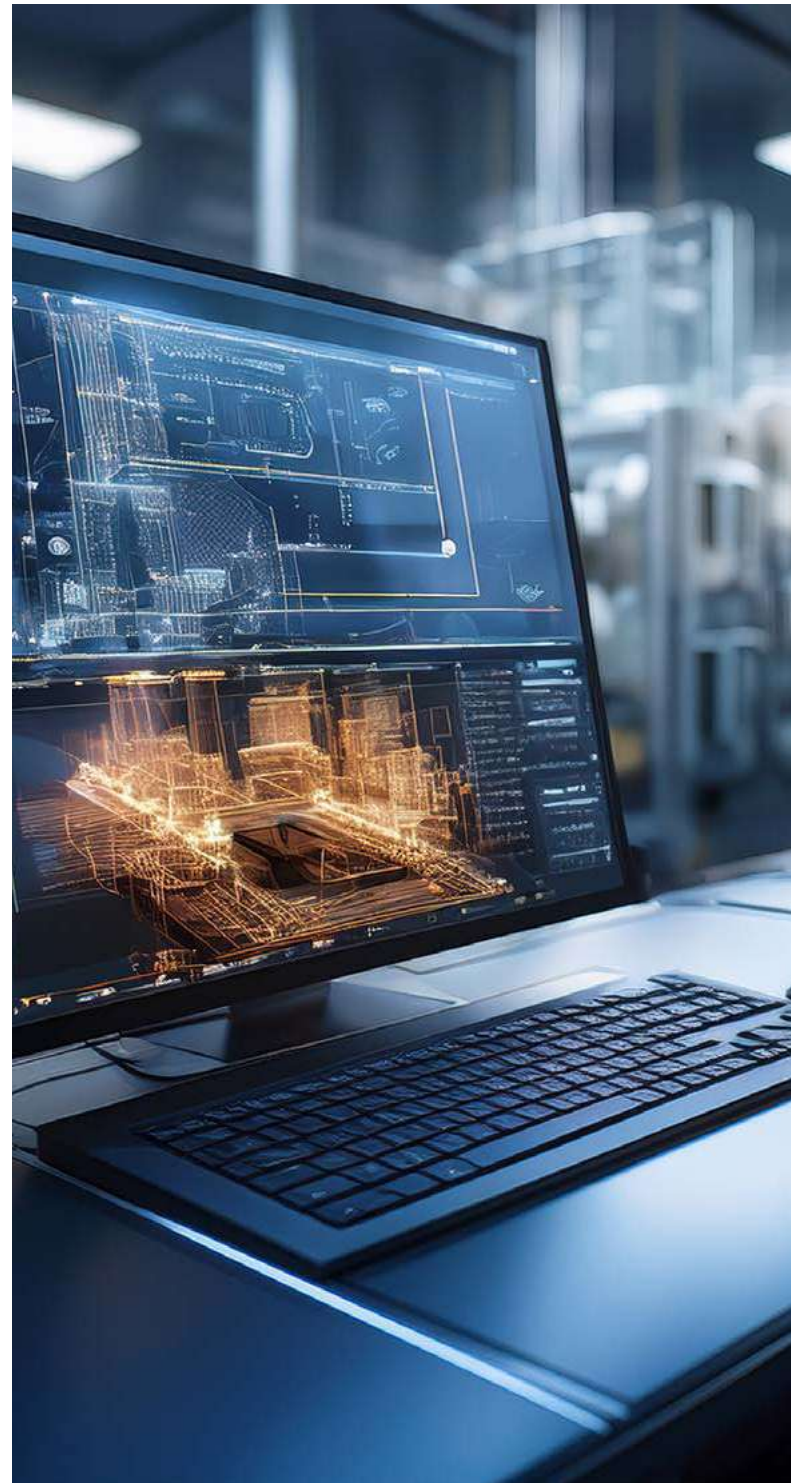
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<https://tagsight.io/blog/pid-to-cmms-asset-register>





Enhancing Safety In Energy Technology

Supply Chains With Digital Data Loggers Managing Transport Risks For Large Industrial Plants And Key Components

It happens quickly and often goes unnoticed: sensitive, high-value industrial goods used in the energy and plant engineering sectors are transported over weeks or months, passing through numerous transshipment points, and sustain damage due to extreme temperature, humidity or mechanical stress. Particularly in the case of large or heavy components, such damage often goes undetected for a long time. Companies frequently only realise the damage has occurred once they reach the project site – and are then faced with the challenge of providing reliable evidence of the damage. In this context, digital data loggers are a useful tool for transparently documenting critical transport events and minimising risks in advance.

Global supply chains are indispensable in the energy sector. Transformers, turbines, generators, switchgears and specialist components for grid infrastructure and power station projects often travel thousands of kilometres before reaching their destination. During this time, they are exposed to extreme weather conditions, long periods of inactivity at interim storage facilities, ports or borders, as well as high mechanical stresses. Particularly in the case of project-related transport, deviations from the planned schedule are almost impossible to avoid – with potentially serious consequences for the functionality, service life and commissioning of the equipment.

The advantages of global procurement – the availability of specialised components and cost-efficiency – are therefore accompanied by

significant risks. Every additional handling of heavy energy equipment increases the probability of impacts, vibrations or mishandling of the cargo. Political uncertainties, stricter customs controls and geopolitical tensions further prolong transit times and result in project cargo being held up unexpectedly or packaging being opened.

Energy technology capital goods are particularly susceptible to damage “The situation is particularly critical in the energy and plant engineering sectors,” explains Josia Fritz, Product Manager at ASPION. The high-tech company from Karlsruhe, specialised in modern sensor technology, develops shock and climate data loggers specifically for the transport of high-value capital goods. Fritz is familiar with the challenges faced by companies whose projects are highly deadline-driven and where transport damage can quickly lead to significant delays. Transformers, turbines and large motors are sensitive to excessive impact, vibrations or climatic fluctuations, even if these are not immediately apparent from the outside. “In many cases, damage is only discovered during assembly or commissioning,” reports Fritz. “It must then be documented in a traceable manner under which transport conditions the equipment was subjected to stress.”

It is true that complex packaging and securing methods are used for large-scale energy technology components. However, even these reach their limits when heavy industrial goods are set down roughly during handling, containers shift during emergency braking, or equipment is exposed to extreme temperatures for weeks on end. Mechanical shock indicators or simple temperature strips merely provide snapshots of the situation. It is therefore not possible to reconstruct the entire



In y ggers e - Scale nts

transport journey. For transport insurers, however, objective evidence of damage based on reliable measurement data is crucial.

Data loggers provide transparency for complex energy transports. Modern transport data loggers bridge this information gap. "Our data loggers record temperature, humidity and mechanical stresses, and store relevant events with a timestamp," explains Fritz. The threshold values are defined on a project-by-project basis and tailored to the specific energy technology component. The devices are attached directly to the piece of equipment or its transport frame and accompany it along the entire route. The measurement data can then be read out via a smartphone app – both at the destination and at transshipment points. Particularly in the case of complex energy technology transports, this enables a condition assessment to be carried out whilst the project is still ongoing, for example before onward transport or installation. "Data security plays a central role here," emphasises Fritz. "With our ASPION G-Log data loggers, the measurement data is secured by PIN protection and safeguarded against tampering." Unauthorised access or alterations are detected and flagged accordingly.

Live tracking: A key advantage for energy projects

Data loggers with a live tracking function offer an additional safety benefit. Josia Fritz: "A 360-degree live tracking system such as the ASPION L-Track transmits status and location data continuously via mobile networks worldwide. An alert is automatically triggered if thresholds are exceeded or in the event of exceptional occurrences." This real-time information can be crucial, particularly in time-critical

energy projects, such as the expansion of grid infrastructure or power station overhauls. It enables companies to intervene immediately, halt transport operations or implement alternative measures before damage occurs or worsens.

Expert guidance for complex energy products

Data loggers generally record measurement values autonomously. However, interpreting the data meaningfully is a challenging task, particularly in the case of heavy energy technology components. "Which accelerations are critical depends heavily on the size, weight and transport route of the equipment," explains expert Josia Fritz. "ASPION therefore supports industrial customers in configuring the devices and analysing the measurement data." This is because transport stresses do not consist solely of individual impacts. Vibrations and shocks during loading operations, dynamic stresses during road transport or brief extreme events can damage sensitive components. "The longer an impact lasts, the greater the likelihood of serious damage, because not all impacts are the same: a controlled settling process can be clearly distinguished from a hard impact," summarises Fritz.

Learning from real-world transport data for future energy projects. The benefits of digital data loggers go beyond providing evidence of damage in the form of reliable indicators. Companies gain a realistic picture of the stresses their energy-related installations are actually subjected to on specific routes, with specific modes of transport or logistics partners. "Data loggers act like a black box for energy projects," explains Fritz. The insights gained help to optimise packaging concepts, adapt transport strategies and reduce risks right from the project planning stage. This enables consequential damage, project delays and additional costs to be avoided in the long term.

Conclusion

Digital data loggers are a key tool for the safe transport of high-value capital goods in the energy and plant engineering sectors. They provide objective measurement data on climatic and mechanical stresses, enable early risk detection and serve as compelling evidence in the event of damage. When used correctly, they help companies to implement energy technology projects in a more predictable, safer and more cost-effective manner.

Author: Julia Kowal, Editor at Wordfinder

Further information: www.aspion.de



Maintenance Is Not a Video Game: Human Decision-Making **Still Matters**

A

It is changing how maintenance teams monitor assets, predict failures, improve reliability, and optimise maintenance activities. AI can process vast amounts of equipment data faster than any human.

Yet one reality remains unchanged: maintenance is not a video game, and there is no reset button when things go wrong.

Industrial environments are full of hazards. Decision-makers carry responsibility, and every decision has consequences. Responsibility cannot and must not be delegated to AI.

If data does not become actionable information, it has no value.

In vibration-based condition monitoring, AI processes far more data than a human expert—but often produces far more findings for the expert to review. This burdens already limited expert resources.

The objective should not be to generate more alarms, but to filter out those that do not require expert attention.

While machine-learning systems can recognise patterns in machine behaviour, they do not understand failure mechanisms the same

way as experienced, certified vibration experts with hands-on field experience. Experts also understand how proactive actions, such as lubrication and load reduction, prevent repairs.

Data can reveal developing issues, but converting those findings into effective maintenance actions requires human expertise. Automation should help experts focus on the findings that matter most, not create more alerts to investigate.

AI loves continuous data, but data quality matters more than quantity. Too often, data volume substitutes for data quality. AI benefits from continuous data, so IoT technology is added, data streams grow, and the focus shifts from making an impact to reviewing alerts.

For many plants, route-based measurements remain one of the most cost-effective and comprehensive approaches.

If route-based measurement cannot produce high-quality input data for AI, adding more sensors will not solve the problem.

At Asensiot, automation and people screen maintenance actions—not just data.

Asensiot combines high-quality monthly route-based vibration

Screen Actions, Not Alarms

Combining Technology With Human Expertise.



myasensiot®
CONDITION SCREENING



***NEW MyAsensiot RDC:**

Example of customer field application menu.

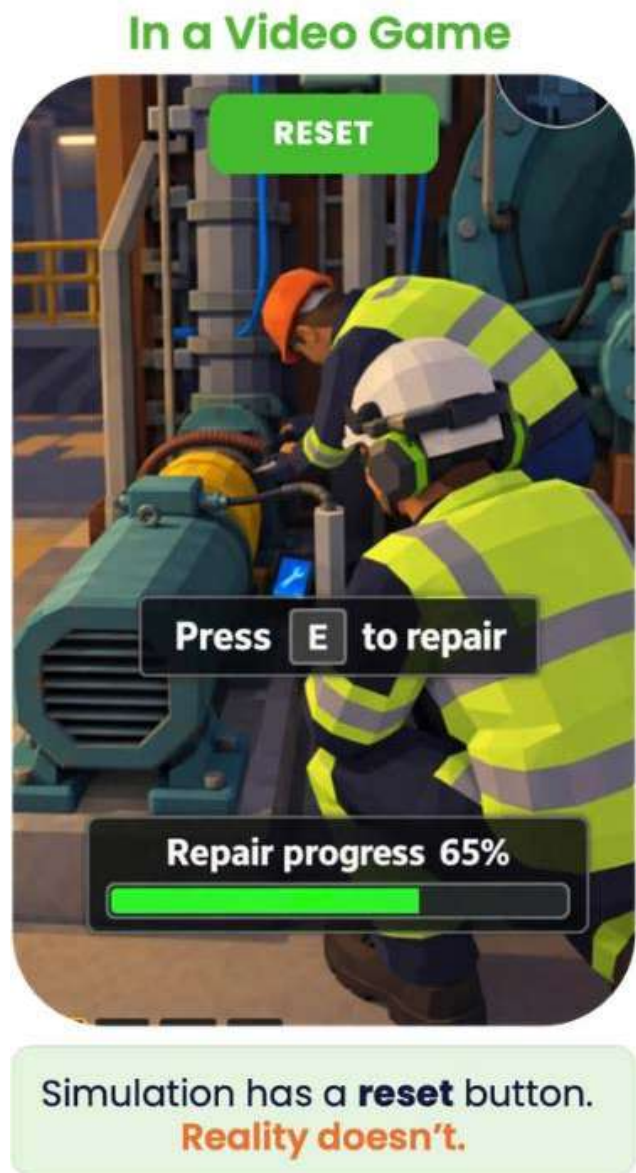
measurement with your existing field routines and applications. Where needed, we add online measurements or support existing online data.

This enables plant-wide coverage of all assets, not just critical equipment. Combining vibration measurements with existing field routines improves overall impact efficiency.

Without an expert layer, data remains just data. Expert screening transforms data into actionable information that guides maintenance decisions by defining what needs attention, what action(s) to take, and when to act. Real value is created when actions are verified, outcomes are measured, and root causes are understood. This is the foundation of MyAsensiot Condition Screening®.

Our ISO-certified vibration experts review reliable automated highlights and refine them into clear, prioritised maintenance actions. We help maintenance and reliability teams focus on performance improvement, rather than sorting through large volumes of data and alerts. Asensiot's new MyAsensiot RDC (Route Data Collector) connects your field applications and routines with high-end vibration measurement. The new MyAsensiot RDC is a lightweight field device designed to work alongside existing field applications, including inspection checklists and safety observations. It enables fast, high-quality vibration measurement collection as part of normal monthly routines and existing field workflows.

The challenge in maintenance is rarely collecting more data. The real challenge is collecting relative data and turning data into actionable information that supports better maintenance decisions. This principle is at the core of Asensiot's approach. In maintenance, the goal is not more data. The goal is better decisions.



From Measurement to Maintenance Action



Condition Monitoring

Do You Need A Handheld Vibration Meter?



Bridge the gap between fixed monitoring and reactive maintenance. A handheld vibration monitor gives your team the flexibility to verify machine health, validate sensor data, investigate issues instantly, and assess assets across your plant.

With real-time measurements at the source, you can make faster, more confident maintenance decisions when it matters most.

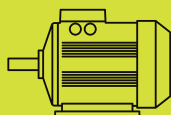
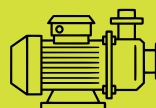
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Smarter Asset Decisions: Turning Data **Into Action**

Maintenance operations make dozens of judgement calls every day — often without the full picture. Teams must decide how often a machine needs servicing, whether an ageing asset is worth one more repair, or if they're properly resourced for the workload ahead. Incomplete data compounds the risk of missed failures, wasted spend and a stretched workforce.

Historically these decisions have rested on experience, static reports, and gut instinct. Not because teams lack data, but because turning it into a clear answer takes time and specialist expertise, most operations don't have spare. Agility AI, built into Aptean Agility Enterprise Asset Management (EAM), closes that gap. It reads live asset, cost, and work-order data and delivers a tailored, plain-English answer in seconds.

Whether the question is operational, such as checking a PPM schedule, or strategic, such as what downtime is costing across sites, the answer

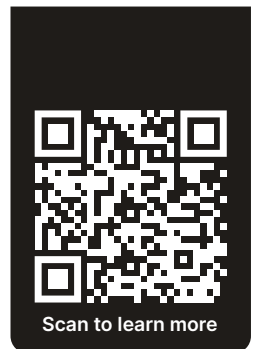
is just a question away.

Customers already using Agility AI are seeing the impact. At Wienerberger UK, a leading building materials manufacturer, Head of Engineering and Continuous Improvement Ali Ben Henda found that it flagged assets with repeated breakdowns lacking appropriate Planned Preventative Maintenance (PPMs), and recommended a suitable maintenance plan based on breakdown reasons.

It's the kind of gap that's easy to miss across hundreds of assets and multiple sites — a pattern AI can catch before it escalates. What makes this shift significant isn't just the technology; it's who can use it. Insight is no longer limited to those skilled at reporting, anyone on the team can ask a question and get a clear answer.

As shift supervisor, procurement lead and finance director can each ask their own questions and get an answer shaped to their role.

[To see how this applies day-to-day, our new eBook, Making Smarter Asset Decisions With AI, explores it further.](#)



Smarter Maintenance Starts With AI-Powered Agility CMMS/EAM

Ask a question in plain language. Get an instant answer from your own asset data — and make your next maintenance decision with confidence.



Ask Agility AI to surface at-risk assets before they become downtime



Get instant, plain-language answers to support faster decisions



One connected view of your assets, people, parts and sites



Drive measurable ROI across your operation



Smarter Hydraulic Maintenance: Using Digital Tools To Maximise Machine Availability

Digital service tools are helping maintenance teams identify components, troubleshoot faults and plan maintenance more efficiently, supporting greater equipment availability and productivity.

For maintenance teams working to minimise unplanned downtime and extend equipment life, having the right technical information readily available can make a significant difference. As hydraulic systems become increasingly sophisticated, finding the correct documentation, identifying components and diagnosing faults quickly are essential to keeping machinery running efficiently.

Bosch Rexroth's Hydraulic Hub is a digital platform designed to simplify and accelerate hydraulic service and maintenance by bringing together product information, technical expertise and troubleshooting tools in one accessible place.

Available through a web browser on computers, tablets and smartphones, the platform gives service and maintenance personnel access to information around the clock. It enables users to identify almost half a million Rexroth industrial hydraulic components and retrieve relevant resources, including data sheets, service manuals, diagnostic tools, spare parts information and product lifecycle recommendations.

From reactive repairs to proactive maintenance

When a fault occurs, time spent searching for documentation or identifying the correct component can delay diagnosis and repair. Hydraulic Hub helps maintenance personnel access relevant information more quickly, supporting a more focused approach to troubleshooting and reducing unnecessary delays.

The platform also supports proactive maintenance planning. Teams can create maintenance plans and checklists, helping them structure servicing activities and address potential issues before they develop into more disruptive problems.

This approach can help organisations make better use of maintenance resources, improve consistency across teams and support the reliable operation of hydraulic equipment throughout its working life.

AI-assisted troubleshooting

Artificial intelligence is also being applied to help service personnel find answers and diagnose faults. Hydraulic Hub includes a Smart Assistant that allows users to ask product-related questions interactively, while Smart Diagnosis helps identify possible faults from a description of symptoms or an entered error code.

The tools provide tailored information and suggested solutions to support faster troubleshooting. They can be particularly useful when personnel need to investigate an unfamiliar issue or locate specific technical guidance during a service task.

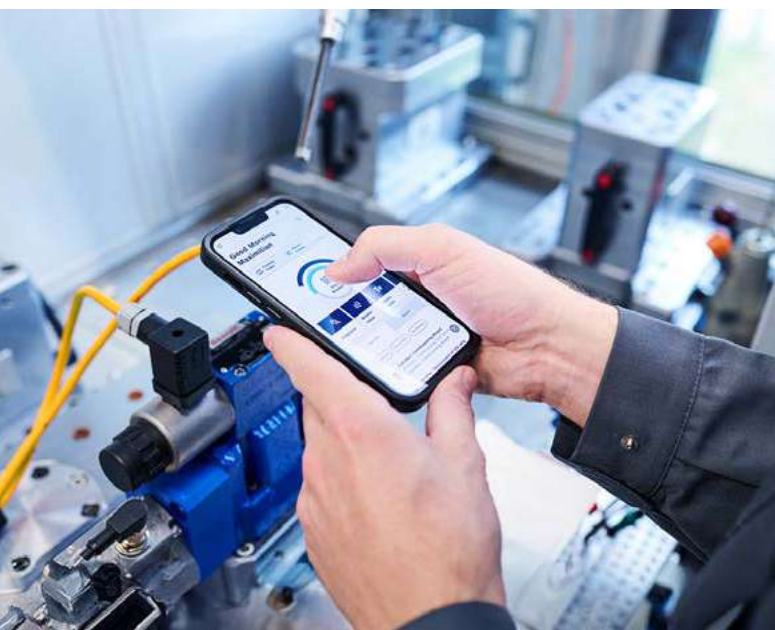
By making service knowledge more accessible, digital tools can also support less experienced technicians while helping established maintenance teams work more efficiently.

Supporting maintenance performance

Digital tools are most effective when combined with sound maintenance practices and the expertise of experienced engineers. By bringing product information, diagnostic support and maintenance planning together, Hydraulic Hub gives teams another way to make informed decisions, respond to problems and plan servicing activities.

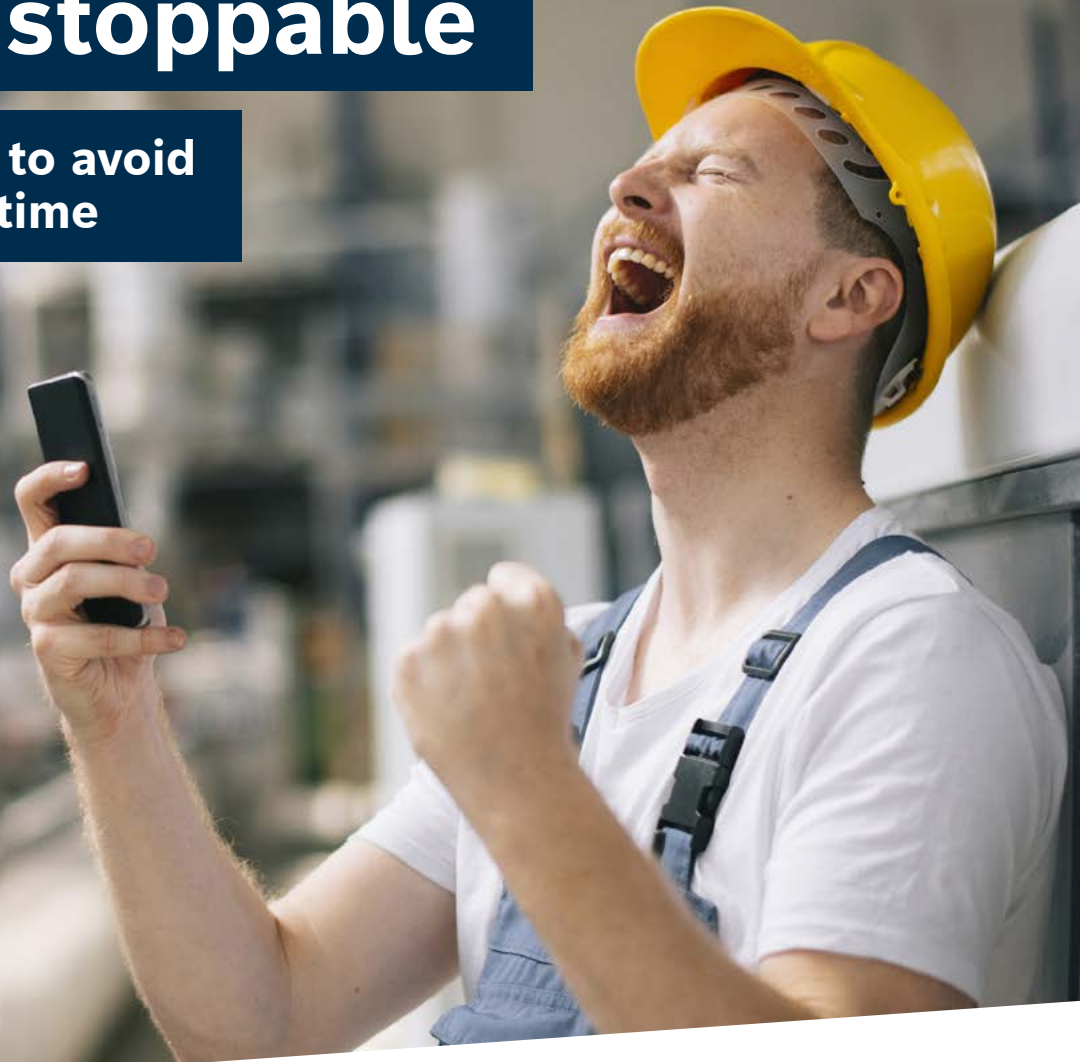
For manufacturers looking to improve equipment availability, reduce avoidable downtime and get more value from existing machinery, making technical knowledge easier to access is an important step towards smarter maintenance.

To find out more about Bosch Rexroth's Hydraulic Hub and service offering, visit www.boschrexroth.co.uk



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CAT-II Mar, Jul, Oct
CAT-III May, Nov

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CAT-I TBC
CAT-I Onsite
CAT-I Online

INFRARED THERMOGRAPHY
CAT-I Public TBC
CAT-I Onsite
CAT-I Online

MAINTENANCE RELIABILITY
MRT Solo
MRT-Quick Start
MRT Enterprise

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By helping maintenance and reliability Teams detect developing faults at an early stage, Hansford Sensors supports better maintenance decisions, reduces unplanned downtime and helps protect critical machinery.

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Quality Compost From Borger Pump And **Macerator**

Borger has completed the installation of a new pump and macerating system for a processing plant that converts food waste into nutrient-rich compost.

Featuring an auger, grinder and rotary lobe pump, the highly robust Borger system methodically moves and reduces acidic food waste, ready for composting.

Designed with Borger's Maintenance-In-Place for ease of servicing, the reliability of the custom-built system greatly reduces downtime.

By macerating the solids so efficiently, the Borger Multicrusher homogenises food waste to help facilitate the most effective pumping process.

In addition to composting, Borger's pumps and macerators are widely used at biogas/AD plants, including the award-winning Creed Integrated Waste Management Facility on the Isle of Lewis, Scotland. Here, a Borger Multicrusher chops a 7-cubic tonne batch (per shift) of waste salmon. The technology guarantees the shred of waste salmon to meet stringent regulations for the safe use of digestate as a renewable fertiliser, by cutting the waste to the required maximum particle size of 12mm.

Also, at three Singleton Birch biogas plants in Northern Lincolnshire, England, a total of four Borger rotary lobe pumps are an integral part of the AD process that utilises maize, sugar beet and chicken litter as its feedstock.

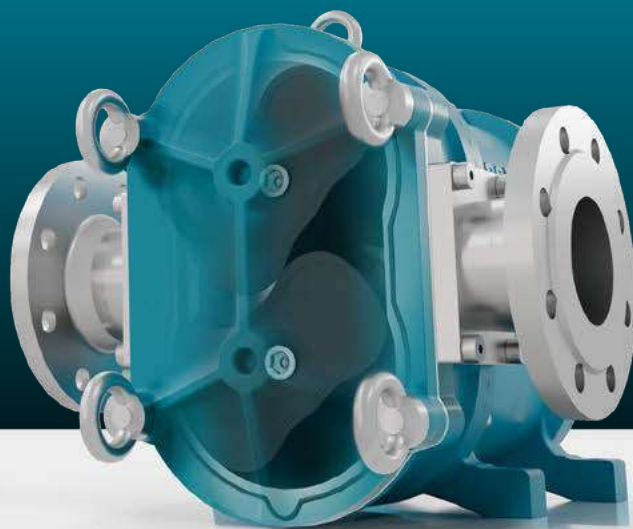
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Distillery In India For Landia Gasmix Biogas Digester **Mixing System**

Landia has secured an order to supply its acclaimed GasMix Biogas digester mixing system to one of India's largest distilleries, where wastewater will be utilised for the site's biogas plant.

The Landia GasMix, which already has over 1,700 installations worldwide, is designed so that everything can be easily accessed from outside the tank. As part of the GasMix system with its venturi nozzles, 30kW, 1500rpm Landia Chopper Pumps will break down solids from the distillery's waste stream and keep them in suspension to maximise the mixing process and gas yields.

Producing some of India's biggest selling whiskies, gins, vodkas, rums and brandies, the distillery has already reduced its dependence on the national grid by 60%, thanks to a new high-pressure turbine. By effectively recycling a mixture of liquid and biogas at the new AD plant, the Landia GasMix will make the distillery even more self-sufficient. This latest order for Landia follows its work at the Rosemaund Farm Distillery in England, where a new premium single malt whisky is being produced, with a Landia pump playing a key role in the handling of the site's wastewater.

Guy Ritchie, Creator of the Netflix series, The Gentlemen, is an early

backer, shareholder & creative collaborator at Rosemaund, who have recently announced their third release; a whisky made with Maris Otter barley, distilled and aged among apple orchards on the family farm in Herefordshire.

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MAINSTREAM UK 2026: Year Two, **Twice the Size**

MAINSTREAM UK returned to Millennium Point in Birmingham in October 2026 for its second year, bringing together an expanding community of asset management, maintenance and reliability professionals from across the UK and further afield.

Following the successful launch of the UK event in 2025, this year's MAINSTREAM was approximately twice the size, demonstrating both the growth of the event and the appetite within industry for opportunities to share practical maintenance and reliability experience.

Over two busy days, Millennium Point became a meeting place for engineers, maintenance leaders, reliability specialists, asset managers and technology providers. While presentations formed an important part of the programme, some of the most valuable discussions inevitably took place between sessions, as delegates compared experiences, discussed common challenges and shared approaches that have delivered results within their own organisations.

MAINSTREAM originated in Australia as a community for the people responsible for keeping industrial assets operating safely, efficiently and reliably. Its rapid development in the UK suggests that the issues facing maintenance professionals are remarkably consistent regardless of geography or industry.

Whether managing a water network in northern England, manufacturing equipment in the Midlands or mining assets in Western Australia, organisations face many of the same questions surrounding ageing infrastructure, skills shortages, reliability, digitalisation, leadership and the transition from reactive maintenance towards more proactive strategies.

Industry Past Meets Industry Future

Birmingham provided an especially appropriate setting for this year's event.



The opening evening brought delegates together among historic steam engines, manufacturing equipment, cars and aircraft associated with Britain's industrial heritage. In a city synonymous with the Industrial Revolution, discussing the future of asset management while surrounded by machines that helped shape modern industry provided a memorable backdrop.

The conference programme itself covered an exceptionally broad spectrum, moving from leadership and workplace culture through training, reliability metrics and maintenance strategy before eventually taking delegates beyond the Earth itself.

Ian Schubach, African Safari Guide and Adventurer and CEO of Red Leaf, delivered The Nature of Success. Drawing lessons from the behaviour of African wildlife, Schubach explored how maintenance leaders can develop organisational cultures that are adaptable, proactive and collaborative.

Russell Raath of The Ambition Company followed a different leadership path with Stop With the Strategy, Start With the Power of Ambition. His presentation examined the Strategy Paradox and the Science of Ambition, drawing upon research involving more than 200 transformative leaders.

For maintenance organisations, however, leadership strategy must increasingly be accompanied by investment in people.

Phil White, Chief Maintenance Officer at United Utilities, addressed one of the industry's most pressing concerns in Building the Skills of the Future. With experienced technicians approaching retirement across many sectors, preserving knowledge and developing the next generation of skilled maintenance personnel has become a significant operational challenge.

White examined competence focused training and the work being undertaken through the United Utilities technical training centre. The session reinforced the importance of developing genuine practical competence rather than treating training simply as a compliance requirement.

From Firefighting to Reliability

Reliability performance was another central theme.

Walter Nijssen, Senior Director Capital Engineering and Reliability Excellence at Cargill, presented The 4 KPIs That Sustain Reliability Results.

His session considered how organisations can progress from reactive firefighting towards proactive reliability, while also addressing an issue familiar to many maintenance professionals: securing executive support for reliability initiatives.

Maintenance departments frequently understand the financial and operational value of reliability improvements long before the benefits are fully recognised elsewhere within an organisation. Demonstrating those benefits through meaningful performance indicators can therefore be crucial in obtaining management commitment, resources and long term investment.

Perhaps the most unusual session of the first day came from Ed Van Cise of NASA's Moon Base Mission and Systems Interoperability Office.

Moon Base: The Role of Maintenance and Reliability on the Surface of the Moon examined the extraordinary maintenance challenges associated with operating equipment away from Earth.

Although lunar operations may appear far removed from the realities of a factory, utility or processing plant, the fundamental reliability principles remain surprisingly familiar. Equipment must be dependable, failures need to be anticipated and maintenance strategies must account for limited resources, difficult environments and the consequences of unexpected downtime.

On the lunar surface, however, calling the local service engineer is clearly not an option.

The presentation provided an entertaining conclusion to the first day while demonstrating just how universal the principles of maintenance and reliability can be.

A Growing Maintenance Community

Perhaps the strongest message from MAINSTREAM UK 2026 was the importance of community.

Technical developments continue to transform maintenance, with artificial intelligence, condition monitoring, predictive technologies and increasingly sophisticated asset management systems providing engineers with capabilities that would have been unimaginable only a generation ago.

Technology alone, however, does not create reliable operations.

Successful maintenance still depends upon knowledgeable people, effective leadership, communication, practical skills and the willingness to learn from both successes and failures.

That was evident throughout the two days in Birmingham. Delegates questioned speakers, challenged ideas and continued discussions long after individual sessions had finished.

Credit must also go to the speakers who shared their experiences openly, the moderators who kept the programme moving, the sponsors supporting the event, the podcasters and media extending discussions beyond Millennium Point, and the MLN100 advisory community supporting MAINSTREAM's continued development.

From its Australian origins to a UK event that has doubled in size in only its second year, MAINSTREAM has established itself as an increasingly important meeting point for the maintenance, reliability and asset management community.

The next MAINSTREAM UK Summit is scheduled to take place in Liverpool from 18 to 20 October 2027.

If Birmingham 2026 demonstrated anything, it is that the community responsible for keeping industry running has plenty more to talk about.

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INDUSTRIAL MAINTENANCE

LATEST NEWS | OCTOBER 2026

PREDICTIVE MAINTENANCE

Yorkshire Water expands one of the UK's largest condition monitoring programmes

1,500

MORE ASSETS

Yorkshire Water is extending its predictive condition monitoring programme across a further 1,200 wastewater pumping-station assets and 300 clean-water smart pumping assets. The expansion uses electrical signature analysis to identify developing faults, support network resilience and reduce pollution risk.

ARTIFICIAL INTELLIGENCE

Aston University and Genie UK launch AI predictive-maintenance partnership

£379k

KTP PROJECT

Aston University and Genie UK have begun a 36-month Knowledge Transfer Partnership focused on AI-driven predictive maintenance for aerial work platforms. The £378,947 project will develop dashboards and feedback tools designed to improve maintenance decisions, transparency and operational learning.

SMART COMPONENTS

NTN moves 'Talking Bearing' technology closer to commercialisation

3

SENSOR TYPES

NTN is advancing its sensor-integrated 'Talking Bearing', which combines vibration, temperature and rotational-speed sensing with onboard generation and wireless communications. Designed to replace a standard bearing without major machine modifications, it aims to make real-time condition monitoring easier to deploy.

SOURCES

BINDT, 1 Oct 2026 - Yorkshire Water expands predictive condition monitoring programme.
Aston University, 13 Oct 2026 - AI-powered predictive maintenance partnership with Genie UK.
NTN Global, 14 Oct 2026 - Sensor Integrated Bearing 'Talking Bearing' development.

INDUSTRIAL MAINTENANCE

LATEST NEWS | OCTOBER 2026

MAINTENANCE STRATEGY

AI is shifting maintenance from cost centre to value driver

2-5

MARGIN POINTS*

New analysis from McKinsey argues that AI and digital tools are changing reliability, planning, execution, turnarounds and spare-parts management in asset-heavy industries. The report highlights the opportunity to embed data-driven recommendations directly into everyday maintenance workflows.

RELIABILITY

Bearing life: predictive strategies target failure before downtime

PdM

PROACTIVE FOCUS

SKF specialists have highlighted the role of condition monitoring, correct lubrication, contamination control and bearing selection in extending asset life. The focus is moving maintenance teams away from 'fix and replace' behaviour and toward earlier detection of developing problems.

SKILLS & OPERATIONS

UK manufacturers face spare-parts delays as maintenance pressure grows

83%

REPORT DELAYS

Recent UK manufacturing coverage reports that 83% of manufacturers surveyed are experiencing maintenance delays linked to unavailable or long-lead-time parts. The finding underlines the importance of spares strategy, inventory visibility, obsolescence planning and stronger maintenance supply chains.

SOURCES

McKinsey & Company, 23 Sep 2026 - Maintenance meets AI: a proven approach for asset-heavy industries.

Plant Services, 6 Oct 2026 - Predictive maintenance strategies can extend bearing life.

MEPCA, 3 Sep 2026 - UK manufacturers report maintenance delays due to unavailable parts.

*McKinsey cites indicative EBIT impact based on client engagements.

CASE STUDY

Fill4Life™ Perform for Life.™

INDUSTRY

Offshore Oil & Gas

MACHINERY

MAN Screw Compressor

LOCATION

North Sea, Aberdeen, UK

PRODUCT

DECON™

FLUID

Castrol Aircol SR32

WEB

www.fluitec.com

DECON™ was applied in-service to the compressor lube oil system. Bearing temperatures reduced and compressor tripping stopped within hours, with no oil change and no system flush.

Offshore Platform Stops Compressor Trips Within Hours After DECON™ Application

Background

A major operator runs a MAN screw compressor on a West Shetland fixed-leg offshore platform in the North Sea, lubricated with Castrol Aircol SR32.

The unit began experiencing high bearing temperatures that escalated to compressor tripping events. These are automatic shutdowns triggered by the safety system when temperature thresholds are exceeded.

MAN Screw Compressor on West Shetland Fixed-Leg Offshore Platform Returns to Stable Operation: High Bearing Temperatures and Tripping Eliminated



DECON™

The varnish layer on the bearing surfaces was thermally isolating them. Dissolve the deposits and both the heat transfer and the temperature come back on their own.

Results at a Glance

\$2,078,500

savings realized by the operator

320x

return on investment

Within hours

bearing temperatures reduced and tripping stopped

12 pails

DECON™ applied in-service, no production interruption

The Challenge

The root cause was varnish deposition on the bearing surfaces, reducing heat transfer efficiency and causing temperatures to rise beyond acceptable limits. Each trip event results in expensive production downtime on an offshore platform, where maintenance interventions carry significant logistical cost and complexity.

In an offshore environment, repeated compressor trips not only affect production output but also place mechanical stress on equipment and create operational risk. The standard response of draining and replacing the oil would have required significant downtime and disposal of a large lubricant volume.

Our Solution

A&S International suggested that Fluitec's DECON™ be applied to the compressor lube oil system using 12 pails of product. DECON uses patented SOLVANCER® chemistry to dissolve varnish deposits from bearing surfaces and internal components in-service, without requiring an oil drain or system flush.

The treatment was designed to remove the varnish layer that was thermally isolating the bearings and causing the temperature spikes. The result was monitored in real-time via bearing temperature instrumentation on the platform, and oil analysis was conducted to track the condition of the lubricant throughout and after the treatment.

Our Results

The compressor returned to stable, continuous operation without an oil change or system flush.

- Bearing temperatures reduced and compressor tripping stopped within hours of DECON™ application
- Compressor returned to stable, continuous operation without an oil change or system flush
- 12 pails of DECON applied in-service with no production interruption during treatment

With trips stopping within hours, on an active offshore platform, this is a compelling demonstration of DECON's effectiveness in critical rotating equipment applications.

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Turning Incident Reports into Actionable Safety Improvements

Lisa Fitzpatrick, Senior Manager, Safety and Environment Europe

Every organisation shares the same fundamental goal: helping to ensure team members go home safely at the end of the day.

Yet even when teams believe they have done everything right, incidents can still occur. In environments where risks such as working at height exist, even strong safety systems can be tested.

Reporting plays a vital role in identifying opportunities to proactively reduce injuries and incidents. The true value of reporting is realised when reports are translated into meaningful safety improvements.

For engineering and maintenance professionals, turning incident data into action requires a structured approach built on open reporting, thorough analysis, effective prevention strategies and a strong safety culture.

Open Reporting

Open reporting leans on a culture of learning and improvement, encouraging workers to actively identify and report issues to enable organisations to understand what happened, the true root causes and implement effective controls to prevent recurrence.

Alongside this culture, reporting tools should be simple, accessible and easy to understand to reduce barriers and encourage consistent reporting.

The easier it is to report incidents or near misses, the more complete and valuable the safety data becomes.

Prevention Strategies

When planning any task, the first question should be: Is there an alternative way to do this?

HSE guidance is clear: if work at height can be avoided, it should be. Where it cannot be eliminated, controls should follow the recognised hierarchy: elimination, substitution, engineering controls, administrative controls and personal protective equipment (PPE).

Engineering and collective safety measures should form the foundation of any prevention plan, supported by policies, procedures and training whenever elimination isn't possible.

This principle is reflected in the design of JLG Power Towers' low-level access equipment, which is engineered to help reduce risk at source through features including fully guarded platforms and stable working platforms. By prioritising safety from the outset, such equipment may support safe working practices when tasks at height cannot be avoided.

Fostering a Safety Culture

Strong safety systems are built on people feeling responsible, supported and empowered.

When employees feel confident to report concerns and contribute ideas, organisations move from reactive safety management to proactive risk prevention.

When supported by open reporting, thorough analysis, preventative planning and a strong safety culture, they can become one of the most powerful tools in supporting risk reduction and protecting people.

Accident Analysis

Investigating incidents thoroughly is essential to identifying the true root cause. Without proper analysis, corrective actions may only address symptoms, leaving underlying risks in place and increasing the likelihood of recurrence.

Common and effective tools include the 5 Whys technique and fishbone (Ishikawa) diagrams, which systematically explores underlying causes until the root cause is identified. Fishbone diagrams help teams examine contributing factors across categories such as materials, methods, processes, people, environment and equipment.

According to HSE data, working at height remains one of the biggest causes of fatalities and major injuries.¹ Applying structured investigation and analysis methods can significantly improve the selection of effective control measure to help reduce the risk of future incidents.



About JLG

As the world's leading designer and manufacturer of access equipment, material handling vehicles and construction technology, JLG Industries, Inc. (JLG) makes products that help move materials, elevate people safely to height and increase productivity on job sites around the world. Its diverse product portfolio includes JLG® mobile elevating work platforms and telehandlers; SkyTrak® telehandlers; Power Towers low-level access lifts; AUSA transportation and material handling products; and Hinowa aerial and earthmoving machines. JLG also offers an array of complementary accessories and solutions for equipment owners and operators that enhance operational efficiency and equipment versatility. JLG is an Oshkosh Corporation business [NYSE:OSK]. For more information about JLG Industries, Inc., visit www.jlg.com, or find us on Facebook, LinkedIn, Instagram and YouTube.

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SAFER MAINTENANCE: ISOLATION | GUARDING | NOISE & VIBRATION | WORK AT HEIGHT

HSE CAMPAIGN

Noise and vibration: employers urged to act before permanent harm occurs

15,000

HEARING CASES / YEAR

HSE launched a new campaign on 13 October warning that workplace noise and vibration can cause irreversible hearing loss, tinnitus and hand-arm vibration syndrome. The regulator is promoting a simple 'Assess, Control, Protect' approach, with maintenance teams among those frequently exposed to powered tools, rotating equipment and noisy plant.

SAFE ISOLATION

£594,000 fine after workers scalded during steam-pipe maintenance

£594k

COMPANY FINE

Two workers were burned while replacing a leaking gasket at a food manufacturing site. HSE found the task had not been adequately risk assessed and suitable isolation and lock-off procedures were not followed. The case is a strong reminder that stored energy, pressure and temperature must be controlled before maintenance begins.

MACHINE GUARDING

Maintenance engineer suffers life-changing injuries in conveyor incident

£160k

COMPANY FINE

A maintenance engineer suffered catastrophic arm and hand injuries after reaching through an unguarded opening into a running conveyor. HSE found that the dangerous access point had existed for years and that safe systems requiring guarding and isolation were not enforced. The company was fined £160,000.

MAINTENANCE SAFETY CHECK

- Isolate and lock off all energy sources before intervention.
- Keep fixed guards and interlocks effective - never create informal access points.
- Assess noise, vibration, pressure, heat and work-at-height risks before work starts.
- Ensure safe systems are understood, supervised and actually followed.

Industrial-Grade Tablets: Greater Flexibility And Functionality In Manufacturing And Logistics

When errors occur in industrial processes, the cause is rarely found in the machines themselves. Often it is inconsistent processes and data disconnects in the communication chains that hinder efficiency. Tablets designed specifically for industrial use can bridge these digital gaps. They enable digitalization and, as a result, a noticeable optimization of production and logistics processes. However, this requires thorough specification and customization of the hardware and software to fit the specific work environment.

The path to a truly smart factory inevitably involves the consistent digitalization of processes directly on the shop floor. Modern wireless technologies make data and processes accessible and visible in a decentralized manner. However, consumer hardware quickly reaches its limits in this context. What is needed are devices that combine a large screen size and high processing power with the necessary ruggedness to withstand dust, moisture, drops, and vibrations to ensure reliability. Industrial-grade tablets offer decisive business and operational advantages in this demanding environment:

Accurate data capture: Thanks to scan modules, modern camera systems, and AI analysis, data can be captured quickly and, above all, accurately in many situations, thereby significantly improving data quality within the company.

Error reduction through AR/VR: By displaying live overlays of the components requiring maintenance, potentially in conjunction with AR glasses, the error rate can be significantly reduced and productivity increased.

Mobile ERP and MES integration: Tablets running Windows as operating system can execute standard software and can therefore be easily integrated into existing ERP, WMS, and MES infrastructures. This eliminates the need for a subsequent, error-prone transfer of information from paper to IT systems.

On-site documentation: Work order management and the documentation of completed tasks, including photos, can be carried out directly on-site. This ensures that all systems are always up to date. Companies can also maintain audit-proof records of which activities were performed.

Secure internet communication: Thanks to biometric authentication, NFC readers beneath the display, 5G, Wi-Fi communication, and comprehensive encryption—both for data storage and information transmission—tablets are perfectly equipped to meet all security-related requirements.

Industrial-grade tablets from Pepperl+Fuchs

To successfully implement such mobile strategies, companies are increasingly turning to specialized manufacturers. Pepperl+Fuchs is a prime example of this approach. With the Tab-IND series, developed specifically for demanding outdoor use, the company addresses the unique challenges of industrial environments. The advantage of in-house development lies in its adaptability: components can be flexibly modified, for example, using so-called SmartBacks. For certain minimum order quantities, the production of customer-specific extensions is also possible. For the end user, this means a high level of investment security as well as fewer interfaces, since hardware support and system integration come from a single source.

The Tab-IND series exemplifies the modular approach of modern industrial hardware. Application-specific modules can be added via rear interfaces, including infrared barcode scanners, power packs for shift operation, or specialized adapters for machine and vehicle fitting. Available in 8- and 10-inch models with Android or Windows operating systems, they enable use even under extreme conditions thanks to brightness levels of up to 700 cd/m² and a wide temperature range (-20° to +50° Celsius). Operation remains precise even when wearing work gloves or in wet conditions. The tablets natively support all current wireless communication standards (Wi-Fi 6E, Bluetooth 5.3 BLE, 5G, or LTE). They feature a built-in NFC reader beneath the front screen for convenient authentication.

In industrial settings, the mobile portfolio is often supplemented by stationary units. Pepperl+Fuchs offers kiosk terminals (15- and 22-inch, Android 15) for this purpose, which are ideal for access control, as information dashboards, or for interactive workflows at central hubs. Typical use case: on the production line

In modern manufacturing environments, tablets are increasingly complementing permanently installed HMI terminals at individual workstations. The resulting mobility enables new process steps: components or car bodies equipped with RFID or UWB tags can be scanned directly on the assembly line. The tablet synchronizes immediately with the work order management system and provides the worker with context-sensitive tasks.

The added value is also evident in maintenance. Maintenance technicians use mobile devices to read machine data on-site and proactively initiate tool changes via predictive maintenance applications. A key driver of efficiency here is the interaction between the tablets and the sensors installed in the facility. Not only can sensor data be securely retrieved via the device, but the sensors can also be configured directly and used for diagnostic purposes.

Typical use case: warehouse management

Intralogistics requires the highest levels of speed and precision, such as when transporting goods via industrial trucks. Modern industrial tablets support the process right from the moment the operator gets on board: The operator is authenticated contactless via the integrated NFC reader. The system ensures that only authorized personnel operate the vehicle, automatically provides digital work packages, and simultaneously regulates the approved routes.

During operation, the tablet serves as the central navigation and control unit. Through integration with inventory management and ERP systems (e.g., SAP), inventory levels can be scanned and reconciled in real time, either via the built-in camera, connected handheld scanners, or RFID bulk capture that takes just seconds. The system calculates route-optimized paths for the forklift and automatically documents transport orders. Switching between the vehicle dock (including a charging function) and mobile handheld use is ergonomic and can be done in a single motion.

Typical use case: logistics support

Similar opportunities exist in traditional logistics, particularly in order picking. Industrial-grade tablets combine picking, scanning, and shipping operations in a single device or in combination with a handheld scanner. To account for physical strain, ergonomic carrying and strap systems are essential.

In addition, the hardware already offers the performance reserves needed for future AI-supported applications. For example, camera-based systems will be able to automatically verify whether the correct component has been removed from a bulk goods bin. In conjunction with current mobile communication standards, the tablet remains permanently connected to the central IT infrastructure, which significantly accelerates inventory processes.

A comprehensive solution

A rugged tablet for industrial environments—one that can be configured and expanded modularly and puts an end to the paper-based processes of the past—can significantly boost productivity in companies and increase employee satisfaction. As a one-stop system solution provider, Pepperl+Fuchs not only has the right hardware and software but, thanks to decades of industrial experience, also possesses the expertise to offer solutions optimally tailored to the customer's needs or to develop them upon request.

www.pepperl-fuchs.com



AI & ASSET PERFORMANCE

Industrial AI moves from pilots toward plant-wide maintenance decisions

Tata Consultancy Services has launched its Industrial Intelligence Foundry, aimed at scaling AI across engineering and manufacturing. The platform includes configurable AI agents and workflows for asset performance, manufacturing operations, quality and field-service decision-making. For maintenance teams, the significance is the shift from isolated AI trials toward governed, enterprise-scale systems connected to day-to-day industrial workflows.

\$2.3m

ESTIMATED COST PER HOUR OF UNPLANNED DOWNTIME

at a large automotive plant - reinforcing the business case for dependable predictive and condition-based maintenance.

SOURCE: AUTOMOTIVE MANUFACTURING SOLUTIONS / SIEMENS

RELIABILITY

Predictive maintenance faces a rare-failure data problem

As breakdowns become less frequent, algorithms can have fewer genuine failure examples to learn from. Recent automotive analysis points to pooled knowledge across sites, careful focus on critical assets and technician trust as key ingredients. The message for reliability teams is clear: sensor coverage alone is not enough. Alerts must be validated against real outcomes and connected directly to work-order processes.

DRIVES & LIFECYCLE SERVICE

ABB service agreement targets higher cement-plant reliability

ABB has signed a multi-year service agreement with ACC for the Jamul cement plant in India. The programme includes reconditioning ACS800 variable-speed drive modules, with work designed to improve operational reliability while avoiding a major shutdown. A second phase covering a further 25 drive modules is scheduled for the fourth quarter of 2026.

CONDITION MONITORING

Wireless monitoring expands beyond only the most critical assets

IMI says wireless technologies are making condition monitoring more practical across pumps, motors, valves and auxiliary equipment that were previously difficult or costly to connect. The emphasis is on collecting data that supports

MOTOR HEALTH

Electrical monitoring targets faults vibration may miss

AssetWatch has introduced continuous three-phase motor-current monitoring for AC motor-driven assets. The system is intended to reveal overloads, current imbalance and transmission issues that may develop before a strong vibration signature appears, adding another layer to condition-based maintenance.

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