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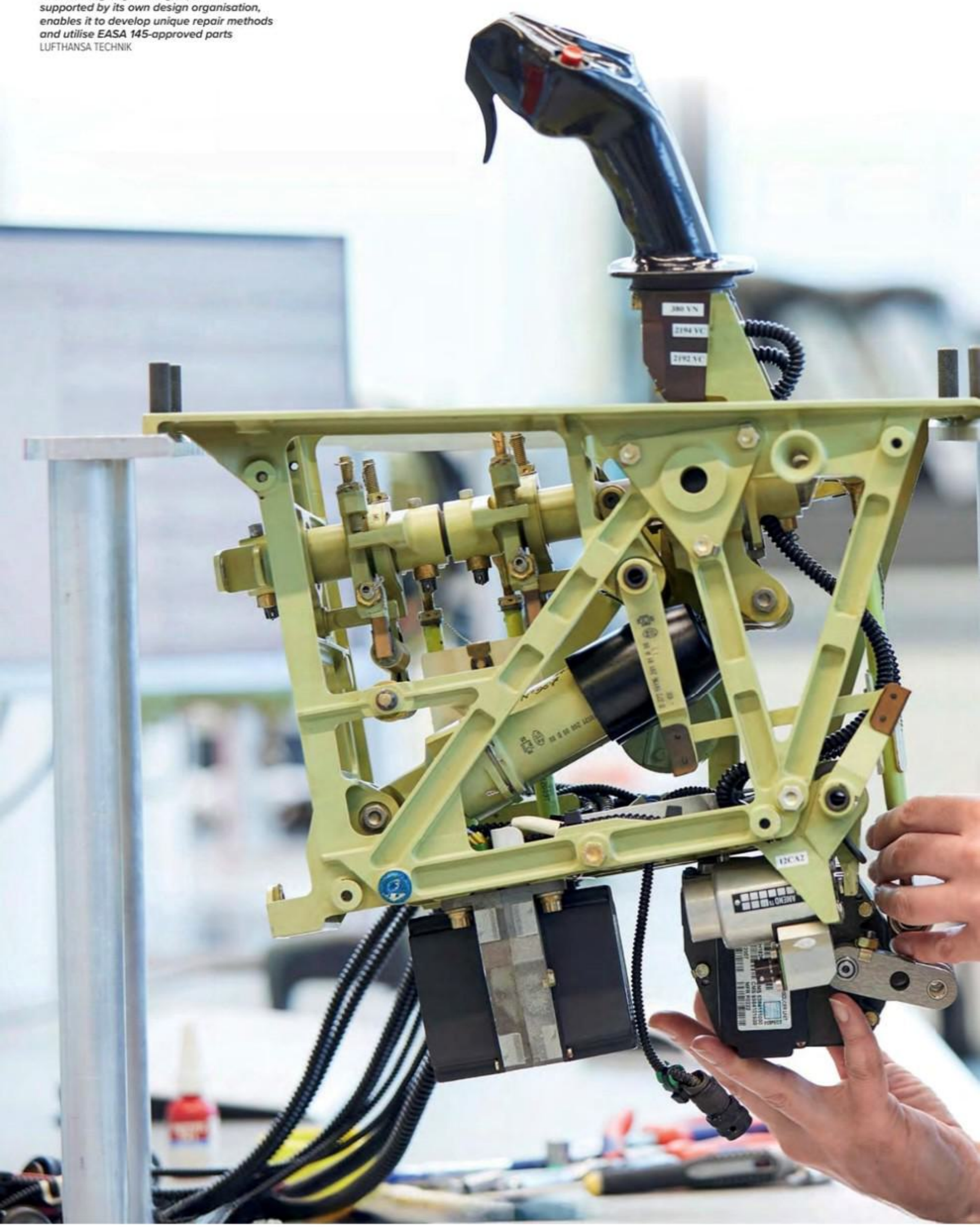
LHT's strong engineering expertise, supported by its own design organisation, enables it to develop unique repair methods and utilise EASA 145-approved parts
LUFTHANSA TECHNIK



COST-CONSCIOUS COMPONENT REPAIRS

A vast number of aircraft components are repairable units. The choice for airlines is whether a repair is the best value. Key MRO providers explain the options

Repairing and overhauling components rather than paying for brand new replacements is an area of MRO that can deliver significant cost savings for airlines. Although a regular practice for many years, the turbulence in the industry during the first half of this decade has brought it much more to the fore.

Although aviation is a global business, any trend towards seeing airlines asking MRO providers to develop repairs appears to differ by region. Ong Soon Yee is head of engineering maintenance services at Asia Digital Engineering (ADE), a wholly owned subsidiary of Capital A Berhad, built on over 20 years' experience as AirAsia's engineering department. He has been observing the repair versus replacement market and does see a growing trend among airline operators and lessors to explore repair solutions over outright component replacements.

"Cost control remains a key priority, especially in a highly competitive market with fluctuating fuel prices and evolving operational challenges," says Ong. "At Asia Digital Engineering, we've seen a notable rise in requests for tailored repair schemes – particularly for high-value and frequently replaced components. Customers are more open to collaborating on repair development, especially when it results in faster turnaround and significant savings without compromising safety or reliability."

Scott Symington, chief commercial officer at AJW Group, concurs: "Customers consistently ask their MROs to identify the most cost-effective solutions, often preferring repairs over full component replacements," he confirms. "Traditionally, some customers and regions have relied exclusively on OEM support and factory-new components.»

LEFT: ***Ong Soon Yee is head of engineering maintenance services at Asia Digital Engineering (ADE), a wholly owned subsidiary of Capital A Berhad*** ADE

However, we are now seeing a clear shift as these same customers increasingly turn to third-party MROs and USM (used serviceable material) as a means of reducing costs.

"When it comes to repairs, the OEM supply chain for piece parts, components and repair services has shown little improvement. Here we are, just over halfway through 2025, three-and-a-half years post-COVID, and the situation remains largely unchanged," Symington notes. "As a result, we are continually working with customers to identify and develop alternative repair solutions that both mitigate ongoing supply chain challenges and deliver the most cost-efficient outcomes."

According to Tim-Oliver Fedeler, senior director, product sales and fulfilment APAC for Lufthansa Technik (LHT), the major MRO provider has long prioritised repairs over

Scott Symington, AJW Group's chief commercial officer AJW GROUP

replacements: "This aligns with our core business model of maintaining components to maximise Mean Time Between Unscheduled Removals (MTBUR) and optimise cost. The company's strong engineering expertise, supported by its own design organisation, enables it to develop unique repair methods and utilise EASA 145-approved parts," he remarks.

"Traditionally, customers in the Asia-Pacific region have been cautious about adopting repair deviations or alternative parts, but recent supply chain challenges and rising costs have driven a shift in mindset. Airlines are now more open to exploring cost-saving repair solutions," Fedeler continues. "However, this requires trust and ongoing dialogue. Lufthansa Technik offers repairs that are not only cost-effective but also deliver enhanced reliability."

Following on from that last point, Fedeler outlines key enhancements added to LHT's component repair programme in recent times: "A notable development includes work on cockpit voice recorder (CVR) and flight data recorder (FDR) systems in collaboration with HENSOLDT for the Airbus A320 Family and further integration and development of AVIATAR predictive maintenance solutions. These initiatives aim to improve reliability while reducing costs, ultimately benefitting airline customers' financial performance," he declares.

At AJW Group, new initiatives have been added to help the airline customer's bottom line. "We have developed and are now introducing a new in-house inventory management system that leverages artificial intelligence to monitor a wide range of parameters," Symington reports. "This system will provide real-time oversight across all aspects of our inventory, from individual piece parts to our MRO operations at AJW Technique.

"The AI-driven platform will offer live monitoring of inventory across our entire component support business, including PBH (power-by-the-hour), trading and our MRO services. It will operate continuously, every moment of every day, enabling far greater visibility, responsiveness and control," he adds.

"As a result, we've enhanced our internal processes and overall efficiency within AJW's MRO to eliminate waste and reduce turnaround times. By integrating this intelligent inventory management with leaner shop operations, we are better positioned to manage parts availability and accelerate repair cycles, ultimately delivering tangible cost savings and »

BELOW: ***AJW Group is seeing a clear shift as customers increasingly turn to third-party MROs and USM (used serviceable material) as a means of reducing costs***
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LEFT: ***ADE's Ong says cost control remains a key priority for its airline customers, especially in a highly competitive market with fluctuating fuel prices and evolving operational challenges*** ADE

BELOW: ***AJW Group has developed a new in-house inventory management system that leverages artificial intelligence to monitor a wide range of parameters*** AJW GROUP

operational benefits to our airline customers," Symington emphasises.

At ADE, new initiatives stretch right across the company: "Our focus this past year has been on building a world-class component MRO hub right here in Malaysia, and our recent initiatives are foundational to that goal," Ong explains. "We've made significant investments to upgrade our capabilities, particularly in advanced structure repair and more complex engine component services.

"Crucially, we're not just adding services; we are building the infrastructure to support future growth. The expansion of our workshop, currently under way not far away from KLIA [Kuala Lumpur International Airport], is a testament to this long-term vision.

"We are already seeing tangible benefits from our investments, with major TAT reductions across the board. For example, our wheel shop now releases 30 or more wheels (overhaul and tyre change) on a daily basis. This speed directly impacts our airline partners' bottom line, as faster, more reliable in-house repairs empower them to minimise their spare parts inventory and reduce capital expenditure. Ultimately, our growth is designed to fuel their efficiency and profitability," Ong declares.

New repairs are not always about a process either. Sometimes new materials aid repair development, as the ADE executive points out: "The use of pre-formed advanced composite materials has opened new opportunities for repairs that were previously deemed complicated," he confirms.

"For example, in the past, components with complex curvatures could only be repaired with a flex honeycomb core. This process required extensive moulding to be prepared, and the moulds often could not be used again. Now, these materials are increasingly available pre-formed, which definitely reduces waste and speeds up the repair process," Ong explains further.

New materials for repairs can also come from the way they are processed, as LHT's Fedeler notes: "Lufthansa Technik utilises 3D printing technology to manufacture replacement parts as part of repair processes. The materials used comply with aviation industry standards and include common 3D printing polymers. We have already developed and printed specific components to repair defective assemblies," he reports.

"The advantage of this repair approach is that it eliminates the need to replace the entire assembly, instead focussing on the faulty part. This leads to a reduction in waste, turnaround time, and cost," says Fedeler.

Coming up with new repairs obviously means that they should meet current regulations. However, some regulations have been around for a long time and are possibly legislative

ABOVE: ***Tim-Oliver Fedeler is Lufthansa Technik's senior director of product sales and fulfilment for the APAC region***
LUFTHANSA TECHNIK

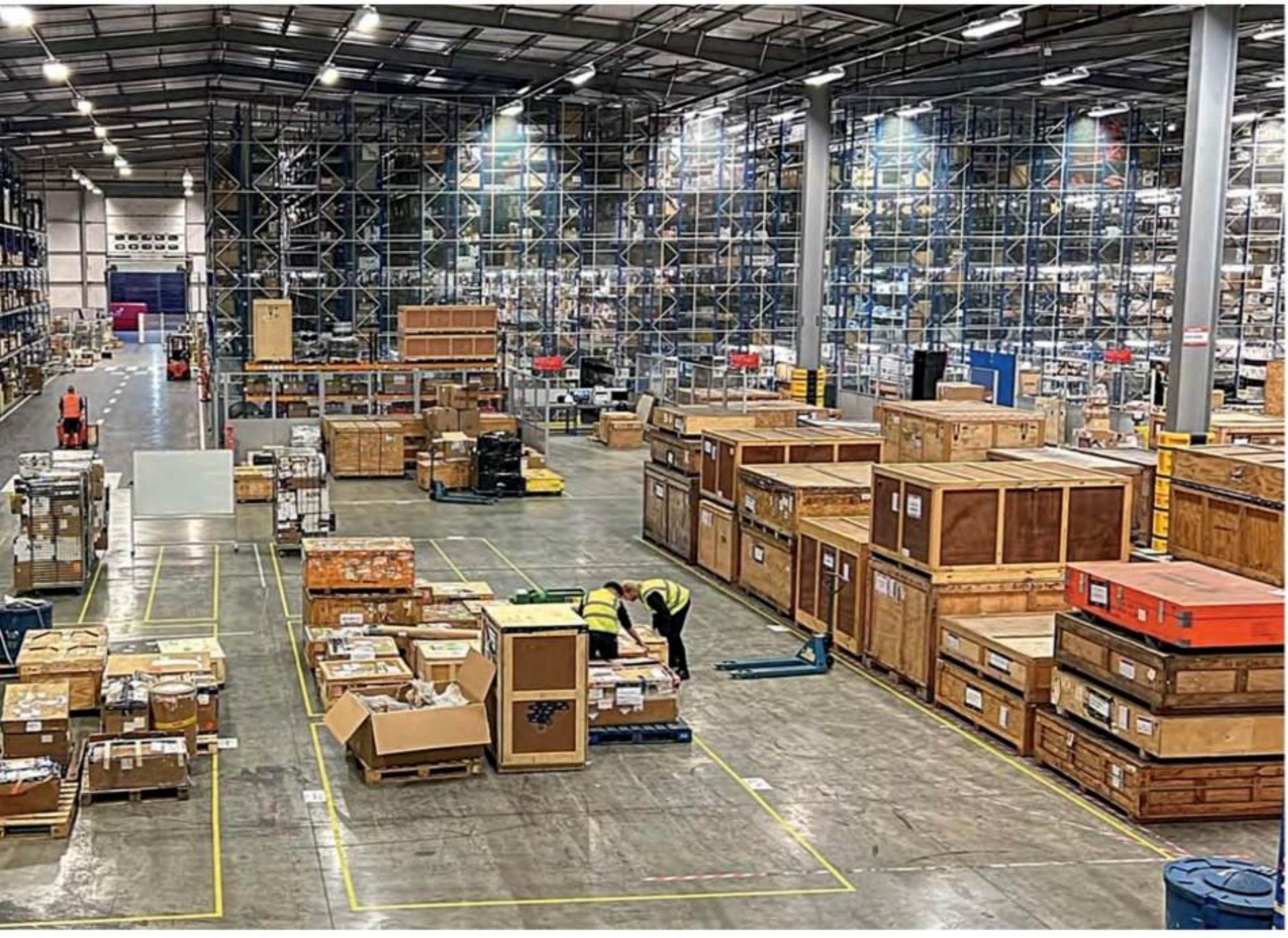
obstacles by being out of date. Fedeler acknowledges the scenario: "Obstacles to repair innovation often stem from airline internal policies that restrict repairs to Component Maintenance Manual (CMM) guidelines, as well as from regulatory frameworks in certain regions or countries that limit the use of alternative parts or repair deviations," the LHT executive observes.

AJW's Symington believes there are several regulatory and contractual obstacles that limit the wider adoption of cost-effective repairs. "Even where repairs have been fully developed and approved, whether under FAA or EASA frameworks, there remain legislative barriers that prevent some national airworthiness authorities from recognising and adopting those approvals," he explains.

"A more collaborative, cross-authority standard allowing mutual recognition of such repairs would significantly streamline the process. At present, there is no automatic adoption, and red tape continues to delay or block viable solutions," Symington argues. "In addition, the growing development and availability of DER repairs and PMA parts is often constrained by aircraft lease agreements. Many lessors prohibit the use of DER or PMA parts on leased aircraft, regardless of cost or performance advantages.

"What is needed is an industry-wide initiative, bringing together MROs, OEMs, airlines and lessors, to define a mutually acceptable standard for DER and PMA usage. However, lessors and financiers, focused on preserving aircraft asset value, often place contractual restrictions that prevent these parts from being used," the CCO notes.

"The real challenge lies in shifting industry perception. Unfortunately, changing this mindset remains a »



LEFT: ***AJW's new inventory system will provide real-time oversight across all aspects of our inventory, from individual piece parts to its MRO operations at AJW Technique***
AJW GROUP

significant hurdle and one that cannot be overcome without co-ordinated industry engagement and regulatory support," Symington laments.

From the ADE perspective, Ong views the current legislative framework and airworthiness references as robust and sufficient. "The regulations rightfully prioritise safety and reliability, and we fully support that," he says.

"The primary challenge we see in developing more repairs isn't legislative. Instead, it's a practical, operational issue; the availability of certified raw materials. Sourcing specialised alloys or advanced composite fabrics with the required documentation can lead to delays that sometimes make a new repair development less viable than a replacement. So, the bottleneck for us is more often in the supply chain than on the regulatory side," Ong explains.

If there is any development affecting every area of aviation, it is artificial intelligence (AI), which, as may be expected, is used in many areas of MRO. "At ADE, we view artificial intelligence as a key enabler of next-generation MRO services," Ong confirms. "From predictive component maintenance to dynamic resource allocation in our warehouse operations, AI allows us to stay ahead of issues before they escalate. This proactive approach directly contributes to better reliability, lower costs and increased aircraft availability for our airline customers."

AJW Group, meanwhile, has been on a three-year transformation journey, focused on redefining aviation efficiency through the integration of AI across its operations. "We're deploying AI in a wide range of areas, from automated quoting and pricing to intelligent inventory management," Symington states.

"We're preparing to run our repair sourcing RFPs (requests for proposals) through our in-house AI platform. This will significantly enhance the speed and accuracy of responses, streamlining the entire procurement process and improving order turnaround. The result is a much more agile and responsive business model that brings us closer to our customers while also delivering a competitive cost advantage," he adds.

"Our use of AI is not simply about automation, it's about enabling smarter, faster decision-making across the board to support our customers more effectively and drive greater operational efficiency," Symington emphasises.

LHT's Fedeler agrees that AI is playing an increasingly important role in optimising MRO operations. He points to the company's AVIATAR platform as an example of leveraging AI for airlines' operations and for predictive maintenance, helping airlines reduce unplanned downtime and streamline repair processes.

"Overall, Lufthansa Technik remains committed to advancing repair solutions, fostering customer trust, and navigating regulatory challenges to provide cost-efficient and reliable component maintenance. Internally, Lufthansa Technik leverages AI to identify patterns, optimise repair processes, stabilise supply chains and accelerate customer service – all to deliver quick, tangible results in a dynamic MRO landscape," Fedeler summarises.

Cost consciousness will continue to be the order of the day in the component repair versus replacement debate. With the advances in repair techniques and a still unsure supply chain, airlines look set to benefit from whichever option needs to be taken.

BELOW: ***AJW Group has been on a three-year transformation journey, focused on redefining aviation efficiency through the integration of AI across its operations***
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