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Management



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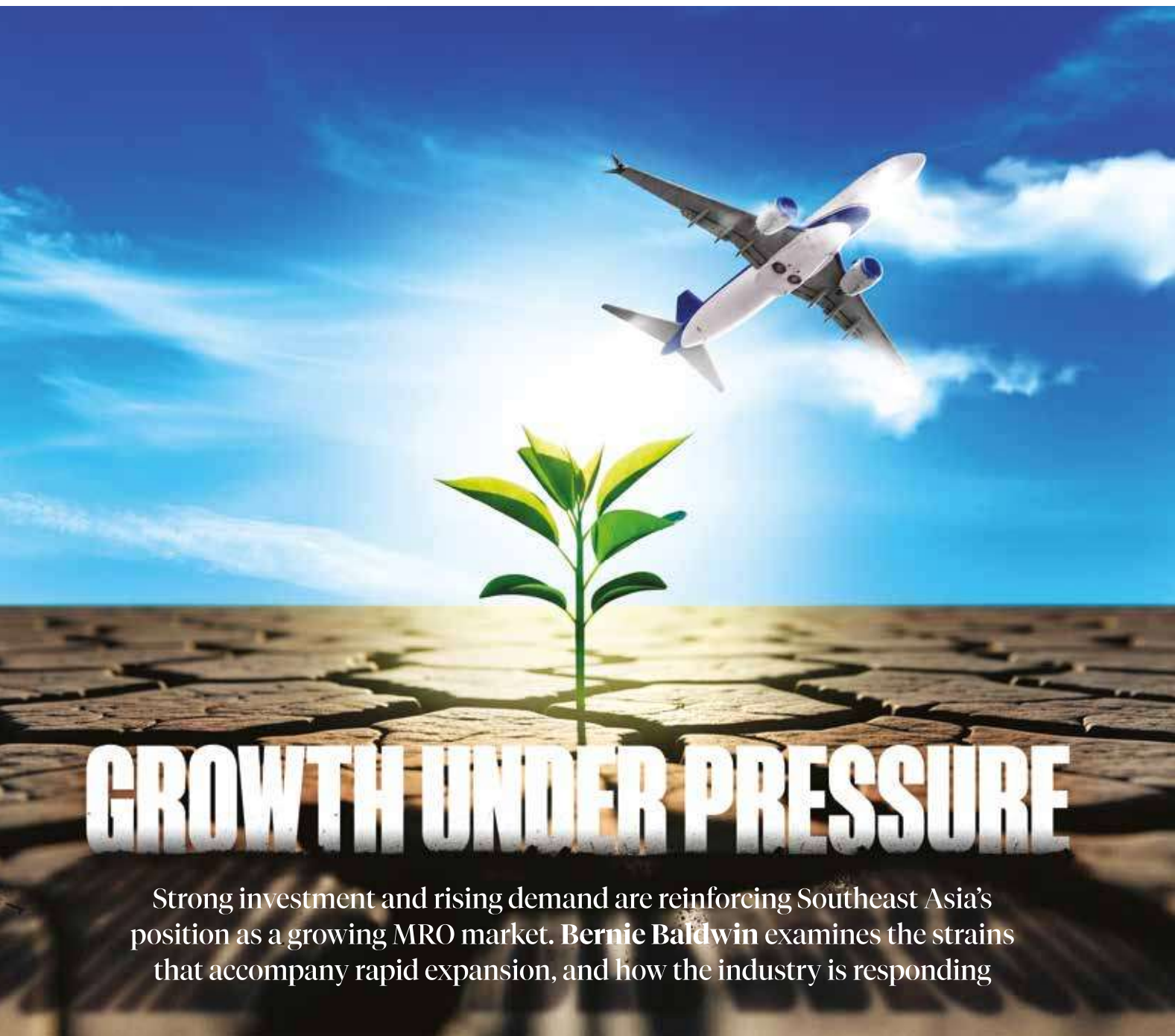
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GROWTH UNDER PRESSURE

Strong investment and rising demand are reinforcing Southeast Asia's position as a growing MRO market. Bernie Baldwin examines the strains that accompany rapid expansion, and how the industry is responding

A quick internet search for Southeast Asia (SEA) will explain that the sub-region of the continent of Asia comprises 11 countries – Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste and Vietnam – and has a population of approximately 676 million people. With increasing disposable income across SEA, its aviation market continues to grow as ever more business and tourism is done across its considerable expanse.

The growing numbers of aircraft based in SEA means a concomitant increase in MRO. Saravanan Rajarajan, assistant vice president and head of consulting – aviation, aerospace and defence at Ramco Systems, has been observing the market, its current status and which MRO segments are predominant.

Vibrant and active

“The SEA aircraft MRO market is exceptionally vibrant, valued at \$4.84 billion in 2026 and growing at an aggressive 10.58% CAGR toward \$8 billion by 2031, according to Mordor Intelligence,” Rajarajan notes. “The region operates with extreme asset utilisation due to surging passenger demand and historical backlogs in new aircraft.”

“The transition from CFM56 and V2500 fleets to LEAP-1A/1B and PW1100G GTF engines is creating a dual-track workload: heavy shop visits on the legacy fleet running in parallel with an emerging LEAP aftermarket that is still building momentum,” he adds. “Component MRO is the fastest-growing segment, driven by avionics complexity and the fact that parts scarcity is pushing operators toward repair-versus-replace decisions they would not previously have made.”

Illustration by Phil Couzens

“Airframe MRO is equally active, driven by aging commercial fleets, with leased variants across the region averaging 18 to 24 years and a structural rise in passenger-to-freighter conversions as e-commerce cargo demand reshapes the Southeast Asian aviation economy,” Rajarajan reports.

With the current scenario assessed, Rajarajan turns to how the market may progress in the near future. “The outlook for the next 12 to 18 months is strong on demand but constrained on capacity,” he explains. “Asia-Pacific airlines posted the fastest international traffic growth of any region in 2025. That sustained utilisation means shop visit intervals are compressing, and line maintenance demand is rising.

“In response, airlines are moving to insulate themselves from third-party vendor delays by expanding captive MRO operations. Singapore continues to anchor the region as its premium aerospace hub, with ST Engineering aggressively expanding LEAP engine capability. At the same time, Indonesia, Malaysia and Thailand are emerging as genuinely cost-competitive alternatives, with significant infrastructure investments and joint ventures narrowing the capability gap with the traditional hub.”

Rajarajan continues: “Vietnam is also entering the frame, with a planned MRO complex at Van Don representing one of the most significant greenfield MRO commitments in the region. For the next 18 months, the market will be defined by whoever can bring qualified capacity online fastest, and the competitive geography of Southeast Asia MRO is shifting as a result.”

Mahesh Kumar, chief executive of Asia Digital Engineering (ADE), says he is seeing airlines increasingly advancing maintenance schedules to ensure fleet readiness amid aircraft delivery delays and ongoing supply chain constraints, thus

driving healthy demand across the MRO sector. “The region has also emerged as a leading MRO hub, combining a skilled workforce, expanding technical capabilities, modern facilities and strategic connectivity,” he comments. “As airlines seek to maximise aircraft availability while managing costs, they are increasingly looking to Southeast Asia for maintenance solutions that offer quality, efficiency, flexibility and competitive turnaround times.”

ADE too is currently focusing on airframe and engine MRO, as well as component workshops. “We are seeing strong demand across these segments as airlines increasingly seek integrated maintenance solutions that improve aircraft availability, reduced turnaround times (TAT) and enhanced operational reliability,” explains Kumar. “This is reflected in our recent US\$100 million financing facility, which will be used to expand our capabilities across airframe maintenance, engine services, component workshops and supporting infrastructure, including the construction of a third hangar at Kuala Lumpur International Airport.”

Like Rajarajan, Kumar believes the outlook remains very positive. “We expect continued growth across base maintenance, line maintenance and specialised repair services, alongside greater investment in digitalisation, predictive maintenance and workforce development to address capacity constraints,” he forecasts.

“MRO providers are also expanding capabilities for next-generation aircraft. At ADE, we are preparing for the Airbus A220 and exploring expansion opportunities beyond Malaysia, reflecting a broader trend of aligning capacity with future fleet growth,” Kumar reveals.

Kevin Chow, president of commercial aerospace for ST Engineering, also sees the



▲ Mahesh Kumar, chief executive, Asia Digital Engineering (ADE)

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Mahesh Kumar, chief executive, Asia Digital Engineering (ADE)



▲ ST Engineering's visual evaluation technology solution at its MRO facility in Singapore



▲ Saravanan Rajarajan, assistant vice president and head of consulting – aviation, aerospace and defence, Ramco Systems

market as robust and highlights engine MRO as experiencing strong growth. “This is especially so for LEAP engines, where demand is outpacing global repair capacity due to rapid fleet expansion and increasing shop visits,” he states, adding that ST Engineering is well-positioned to support LEAP operators in the region and beyond.

Chow adds: “At the same time, airframe MRO demand remains healthy as older aircraft stay in service longer than originally planned. That said, the market outlook should be viewed with some balance. While maintenance demand is expected to stay elevated over the next 12 to 18 months, airlines continue to face pressure from high fuel prices, supply chain constraints and cost inflation, which could affect profitability and fleet planning decisions.”

Chow continues: “Overall, however, we expect MRO demand to remain resilient. In anticipation of sustained long-term demand, ST Engineering has been growing its MRO capacity in Asia-Pacific. More hangars will progressively come online at our airframe MRO facilities in Ezhou, China and Singapore; in engine MRO, we are increasing capacity to support over 400 LEAP and CFM56 engines annually by 2027.”

Under pressure

Across the world, supply chain problems have been prevalent in recent years. Current geopolitical unrest (Ukraine, Middle East, US tariffs and so on) is likely to affect it further.

“While conditions have improved from the peak of the pandemic disruptions, there remain, to some extent, challenges in the supply chain environment in Southeast Asia,” says Chow. “This reflects many of the broader pressures facing the global MRO industry, as it continues to grapple with parts shortages, longer lead times, labour constraints and uncertainty arising from tariffs and trade policies. More recently, geopolitical tensions have added further pressure on logistics networks, operating costs and market stability.”

Ramco's Rajarajan also feels that the Middle East conflict and ongoing Red Sea maritime disruptions have added a further layer of cost pressure. “Critical aero components sourced from European OEMs, which would ordinarily move by sea freight, are increasingly being shifted to air freight to meet induction deadlines, inflating logistics costs and extending transit timelines that were already stretched,” he observes.

Rajarajan adds: “Based on industry assessments, US tariffs introduced in 2025 added an estimated 12-18% to the landed cost of key aero components. The threat of further tariff escalation on raw metals or high-tech dual-use components is a live concern for independent SEA MRO shops.”

Rajarajan continues: “The geopolitical risks compound the structural ones. Russia's conflict with Ukraine severed a titanium supply line the aerospace industry had long taken for granted, and that gap has never been fully closed. China now controls the dominant share of global titanium supply, and rhenium – the material critical to HPT blade alloys – faces the same geographic concentration. The result is persistent scarcity in raw forgings and engine rotating parts, with lead times that show no sign of normalising.

“The cumulative weight of all these pressures on an already tight supply chain is real. SEA operators, particularly the LCC-heavy fleets of Indonesia, Vietnam, Thailand and the Philippines that run lean balance sheets, are absorbing higher leasing premiums for spare engines, extended aircraft-on-ground situations, and growing inventory holding costs that were not in

“ALONGSIDE REPAIR DEVELOPMENT, AI ADOPTION IS RESHAPING HOW MROS ACROSS SOUTHEAST ASIA MANAGE EVERY LAYER OF THEIR OPERATION”

Saravanan Rajarajan, assistant vice president and head of consulting – aviation, aerospace and defence, Ramco Systems



their original maintenance budgets,” Rajarajan notes. “The region’s more progressive MROs are responding by building buffer stocks of critical rotables, locking in power-by-the-hour agreements with OEMs for parts priority, and investing in in-region repair capabilities to reduce dependence on constrained new-part supply, a strategic shift that is as much about supply chain resilience as it is about cost.”

ADE’s Kumar identifies many of the same supply chain challenges. “Geopolitical tensions, shifting trade policies, export control restrictions and tariff uncertainties continue to disrupt logistics routes and procurement flows, often translating into higher costs and longer TATs,” he says. “In response, the industry

has become more resilient, with airlines and MRO providers diversifying suppliers, building strategic inventories, and expanding regional repair capabilities.”

Kumar adds: “At ADE, our digital marketplace Aerotrade also supports this shift by improving transparency and access to parts, helping to streamline procurement and strengthen supply chain efficiency. With its new RFQ (request-for-quotes) feature, Aerotrade further enables buyers to buy parts more efficiently, and make faster, more informed sourcing decisions. For Southeast Asia, this is both a challenge and an opportunity, as the region continues to position itself as a key global MRO hub, with growing investment in localised capabilities that reduce reliance on long and complex global supply chains.”

Innovative opportunities

Supply chain challenges have had an effect elsewhere too. According to Kumar, supply chain constraints have been a key catalyst in accelerating innovation in aircraft repairs. “The industry is shifting from a replace-and-discard mindset to a repair-and-reuse approach, as limited parts availability and longer lead-times make approved repair solutions increasingly critical,” he explains.

◀ Asia Digital Engineering (ADE) has secured a US\$100 million financing facility from QNB Group to support its continued expansion and capacity growth

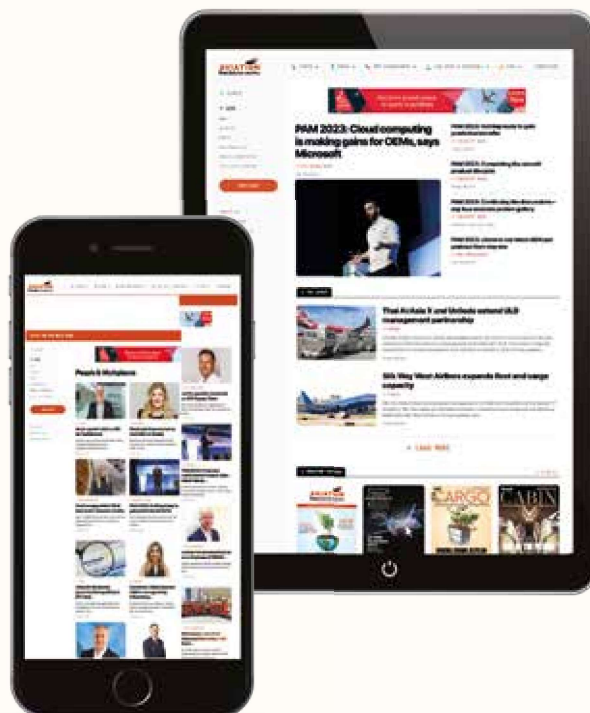
12-18%

US tariffs introduced in 2025 added an estimated 12-18% to the landed cost of key aerospace components, and further trade measures could place additional pressure on Southeast Asia’s independent MRO sector

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▲ In February 2026, ST Engineering's commercial aerospace business agreed an engine MRO deal with Xiamen Airlines to support its CFM LEAP-1A engines



▲ Kevin Chow, president of commercial aerospace, ST Engineering

"This has driven greater investment in advanced repair development, additive manufacturing, digital inspection, specialised component capabilities, and the utilisation of AI to ensure more accurate defect troubleshooting and material forecasting, helping airlines maintain fleet availability while reducing cost and turnaround time," Kumar adds. "What began as a supply chain response has now become a strategic advantage."

ST Engineering's Chow also sees trends in new repairs driven by supply chain issues. "There is growing adoption of digital and advanced repair technologies to improve productivity, reduce TAT and address ongoing supply chain and labour constraints," he declares. "Predictive maintenance will become increasingly common, helping operators optimise maintenance schedules, improve reliability and deploy manpower more efficiently. Automation and robotics are also gaining traction, particularly for repetitive inspection and repair tasks, improving consistency, quality and safety while allowing technicians to focus on higher-value work."

ST Engineering has already embedded these technologies across its MRO operations. Chow provides an example. "A visual evaluation technology solution uses a camera mounted on a robotic arm and AI technology to capture detailed images of the engine's exterior for initial inspection, replacing the need for extensive manual photo-taking and part accountability, while an automated picking and screening sorter autonomously segregates engine parts by quality for repair," he explains.

"For efficient planning and improved schedule quality, we are developing a production planning control system, an AI-driven global scheduling platform that automates and suggests the most optimal utilisation of machinery, manpower and inventory stock."

Ramco's Rajarajan agrees that supply chain pressure has been a major accelerant for repair development. "When new OEM parts are unavailable or carry 12-month lead times, operators and MROs are left with two choices – lease capacity at significant cost or develop a repair to restore the part. That second option is driving a wave of investment," he elaborates.

"Alongside repair development, AI adoption is reshaping how MROs across Southeast Asia manage every layer of their operation. The direction of travel is toward end-to-end digital operations, where maintenance planning, parts availability, and shop floor execution are managed through a single connected intelligence layer rather than siloed systems," Rajarajan remarks.

He adds: "ST Engineering's MoU with Ramco Systems is a concrete example of this shift, embedding agentic AI and advanced MRO platform capability directly into one of the region's largest engine and airframe operations, with the goal of driving measurable TAT reduction and operational efficiency at scale."

With the smart investments and shrewd operations mentioned, the MRO industry in Southeast Asia looks set to flourish for the foreseeable future. ●

"AUTOMATION AND ROBOTICS ARE ALSO GAINING TRACTION, PARTICULARLY FOR REPETITIVE INSPECTION AND REPAIR TASKS, IMPROVING CONSISTENCY, QUALITY AND SAFETY WHILE ALLOWING TECHNICIANS TO FOCUS ON HIGHER-VALUE WORK"

Kevin Chow, president of commercial aerospace, ST Engineering