
© Shutterstock

New Trends in MRO Software

Beyond the Hype: Is AI Ready to Transform Aircraft Maintenance?

By David Dundas

Aircraft maintenance, repair and overhaul (MRO) software is undergoing a period of transformation as artificial intelligence, advanced data analytics and digital integration begin to reshape the way aircraft maintenance organisations manage increasingly complex operations. With pressure to improve efficiency, control costs, minimise aircraft downtime and maintain the highest standards of safety, the capabilities expected of MRO software are evolving rapidly. However, all that glitters is not necessarily gold as technological progress brings its own challenges. Integrating decades of maintenance data, connecting disparate systems and ensuring the reliability of digital tools are significant considerations for an industry where accuracy and traceability are non-negotiable. Meanwhile, the growing prominence of artificial intelligence (AI) raises important questions about its practical value, its limitations and the distinction between meaningful and effective innovation, and little more than marketing hype.

The potential implications extend across the maintenance lifecycle, from preparation for heavy maintenance checks and the management of technical records to planning, engineering and the coordination of resources. Understanding how these developments might influence established working practices is becoming increasingly important for airlines, MRO providers and software developers alike. To examine this changing landscape, we asked ten industry professionals to share their perspectives on the emerging trends in MRO software. Their responses explore the opportunities, challenges and future possibilities associated with this evolving technology, offering insight into how digital innovation may influence aircraft maintenance in the years ahead, and what the industry might look like as it approaches 2030.

Where is AI already delivering measurable value in aircraft maintenance software today, rather than simply being tested in pilot projects?

Here we wanted to find out if there was already sufficient confidence in the influence of AI on newly developed maintenance-related software. Immediately Monica Badra, Founder and CEO of Aero NextGen, Inc turns to the benefits already seen in predictive maintenance and inventory optimisation. She informs us that "MROs running modern ERP platforms with AI modules are already seeing measurable reductions in AOG events by correlating fleet utilisation data, shop findings, and OEM reliability reports to flag components before failure. On the records side, AI-powered extraction tools are compressing the time technicians and engineers spend pulling reference data from AMMs and CMMs — not eliminating the human review, but cutting the lookup cycle significantly. For MROs processing high volumes of AD compliance, that is a meaningful labour saving. For Eric Schech, Director of Product Marketing & Digital Media, Ambry Hill Technologies, "The measurable value today is coming from bounded, high-volume work—not from asking a chatbot to diagnose an aircraft or approve maintenance. The strongest production use cases combine AI interpretation with rules-based workflow automation and a human-review path." He then goes on to discuss Vista-Quote as a current example. "Its AI can recognise a personally written, plain-text RFQ email, identify it as a legitimate request, stage it in a standardized format,



Scott Wells, Managing Director, MRO-PRO

> ***"MRO software has been very good at planning known work, but much less capable of anticipating the emerging defects, parts, tools, services and additional labour that can disrupt an inspection."***
>
> *Scott Wells, Managing Director, MRO-PRO*

and connect the company and part numbers to available history. The original email remains accessible for verification. From there, configurable rules—not generative AI—can route the RFQ, check inventory, control quantity handling, apply restrictions, hold exceptions for review, or drive auto-quoting. That creates measurable operational outcomes: fewer manual touches, faster intake, more requests processed, shorter response times, and clear exception rates. Vista-Quote also supports reason-coded fallout reporting and volume monitoring. "He then concludes: "The distinction is important: AI handles a defined interpretation task, controlled automation handles execution, and people retain authority over exceptions. Within aircraft maintenance software, AI-assisted document classification, work-package preparation, record review, and discrepancy analysis represent promising industry applications. These are areas of potential across the industry, not a description of AI maintenance functionality currently offered in Vista-Suite Enterprise."

Scott Wells, Managing Director at MRO-PRO raises a very valid point as he suggests that, historically, "... MRO software has been very good at planning known work, but much less capable of anticipating the emerging defects, parts, tools, services and additional labour that can disrupt an inspection." He then further elaborates: "A major part of the challenge has been data fragmentation. Relatively small differences in task references, terminology or defect descriptions have historically prevented MROs from analysing maintenance outcomes across broader datasets, even where the underlying maintenance activity is effectively the same. AI changes this by allowing us to understand maintenance intent rather than simply matching labels, enabling related activity to be aligned and analysed collectively. This significantly increases the volume of usable historical data and strengthens the probability models behind planning. AI can then learn from actual maintenance execution data and identify relationships between specific maintenance activities and the defects and resources that subsequently arise. MRO-PRO's multi-award-winning MILE™ Maintenance Intelligence & Learning Engine is being developed around this principle, learning from the results of previous maintenance activities and using that information to improve subsequent planning." He concludes by deducing that: "The measurable benefit is therefore not simply a more sophisticated algorithm. It is the ability to make maintenance workload more predictable, reduce avoidable waiting time and improve utilisation of parts, labour, equipment and hangar capacity.

Which MRO processes have the greatest potential for AI—maintenance planning, troubleshooting, technical records, predictive maintenance, inventory management, engineering, or something else?

We felt there might be more to this question than meets the eye, as we wondered if it wasn't just a question of looking at what areas had the potential to benefit from AI, but also wondering if enough was known about the capabilities of AI to know where it had the potential to be applied? This is answered, to a fair degree, by Eric Schech. "From an industry perspective, the greatest near-term opportunity is likely to be in areas where MRO systems already hold structured operational context: technical records, work-order planning, inventory, labour, BOM activity, discrepancies, and transaction history. This is an assessment of potential applications—not a description of current or planned Vista-Suite AI functionality." He goes on to say that: "Technical records may offer the best balance of value and controllability. AI could help find relevant manuals, extract revision and effectivity information, identify missing documentation, compare records,



Eric Schech, Director of Product Marketing & Digital Media, Ambry Hill Technologies

> ***"From an industry perspective, the greatest near-term opportunity is likely to be in areas where MRO systems already hold structured operational context: technical records, work-order planning, inventory, labour, BOM activity, discrepancies, and transaction history."***
>
> *Eric Schech, Director of Product Marketing & Digital Media, Ambry Hill Technologies*

and assemble evidence for review. Today, Vista-Suite provides the underlying document controls: it stores manuals with revision, effective, and expiration dates; associates them with parts, BOM items, and work orders; and signals when documentation is expired. Planning is another promising area. Vista-Suite currently captures task-level planning hours, labour estimates, material, costs, templates, assignments, WIP activity, and actual results. Across the industry, AI could potentially use this type of structured information to help planners identify resource conflicts, material constraints, and differences between estimates and prior work. Predictive maintenance attracts attention, but it requires sufficient, reliable condition and reliability data. For many MROs, practical AI value may arrive sooner through records, planning, inventory, and exception management. Troubleshooting and engineering should initially remain evidence-backed research assistance—not autonomous technical authority."

Scott Wells has an extremely valid point to make in terms of AI's capability for retention of information that can, for example, take an engineer years to acquire, yet because it is individually owned, when that person retires or moves on, the information, the knowledge, moves on with them. He then explains that: "I think the greatest opportunity exists wherever repetitive processes currently depend on the learned knowledge and experience of individuals. MRO organisations accumulate enormous amounts of expertise through their planners, engineers and technical teams, but historically much of that knowledge has remained with the individual. When experienced people leave, retire or simply move into another role, organisations can lose years or even decades of accumulated learning. AI gives us the opportunity to change that by capturing learned knowledge and embedding it into repeatable organisational processes. That could apply across workpack planning, task classification and sequencing, troubleshooting, defect analysis, technical records and many other areas where experienced people repeatedly interpret information and make decisions based on what they have learned throughout their careers. The objective is not to replace that expertise, but to retain it, systematise it and allow the organisation to continuously learn from it. Predictive maintenance planning and dynamic scheduling are particularly powerful examples. A maintenance package may contain hundreds of planned tasks, but these can generate hundreds of emerging defects and additional requirements. If historical learning establishes that a particular maintenance activity has a significant probability of generating a specific defect, and that defect is likely to require particular parts, tools, services or labour, the MRO can prepare before the problem occurs."

Where Monica Badra is concerned, her focus is on technical records management. Her reasoning is as follows: "The volume of documentation an MRO processes; work orders, airworthiness directives, Part M continuing airworthiness records, EASA Form 1s, 8130-3s, back-to-birth traceability, is enormous, largely unstructured, and still predominantly manual at many shops. AI that accurately extracts, classifies, and cross-references this data against approved maintenance data offers compounding efficiency gains across compliance, audit readiness, and CAMO interface." She then adds: "Maintenance planning ranks close behind. AI-driven workscope optimization that accounts for aircraft utilization curves, fleet-specific modification status, and shop capacity can meaningfully reduce TAT and improve hangar throughput — both areas where margins are tight. Troubleshooting is the third high-impact area. A junior technician's diagnostic path is often bounded by experience. AI referencing historical fault data against the relevant troubleshooting tree can close that gap without compromising accountability. When MROs ask how to identify which AI-enabled platform actually fits their operation, the honest answer is to start by mapping their highest-frequency pain points. That is exactly the logic behind Aero NextGen's Solution Finder: a free, vendor-neutral quiz that matches MROs with best-fit software providers based on workflow, operations, and region: aero-nextgen.com/solution-finder. This moves planning from a largely reactive process towards a probabilistic one, where technicians, capacity, parts, tooling and equipment can be planned around the likely workload, with real-time execution data continuously refining that understanding as maintenance progresses. The fundamental shift is that maintenance knowledge no longer has to leave the organisation when the individual does. It can become part of the organisation's accumulated intelligence and improve every time that process is performed."

How do you prevent an AI system from providing plausible-sounding but technically incorrect information in a safety-critical maintenance environment?

We were interested to discover what contributors thought the temptation to assume that AI systems were watertight, when reality suggests that AI still has a lot to learn about MRO operations, in particular, the finer, but still critical details. Scott Wells gives sage advice when he suggests that: "The starting point is to recognise that AI should support maintenance decision-making, not replace the responsibility of experienced and appropriately authorised personnel. In aircraft maintenance, licensing, certification validity, working time and fatigue controls, inspection requirements and approval responsibilities have to remain mandatory constraints. AI therefore needs to operate within a controlled maintenance environment rather than being treated as a general-purpose system that can make unrestricted recommendations. Its role should be to identify patterns, probabilities and relationships within maintenance data, while engineering and airworthiness decisions remain with appropriately authorised people." However, he is certainly of the opinion that we are far from the stage where AI interventions and input require no human supervision. "An important safeguard is confidence-based human intervention. Where the AI identifies a relationship with a very high degree of confidence, the system may be permitted to make that association automatically while still making it transparent to the user. As confidence falls below defined thresholds, the human is brought into the loop to review, confirm or correct the result. Crucially, those human decisions then become part of the learning process, improving the system's ability to make the same assessment in future. In fact, in a safety-critical environment I think we should deliberately constrain AI. There may be situations where the technology is capable of doing more autonomously, but we intentionally choose not to allow it to. The balance between automation and human oversight should be determined by risk and confidence, not simply by what the technology is capable of doing," he comments, ending by saying that: "Ultimately, probability is not the same as engineering approval. AI can tell us what is statistically likely to happen, help us prepare for it and significantly improve decision

support, but accountability for maintenance and airworthiness decisions must remain with appropriately authorised humans."

Monica Badra gets straight to the point as she responds: "The answer is constraint architecture. Trusting a general-purpose large language model to reason about AMM tasks, CMM limits, or AD compliance without structural guardrails is a safety liability. What prevents hallucination in a safety-critical environment is forcing the AI to operate as a retrieval and synthesis layer over approved, version-controlled documentation, not as a generative inference engine running on training data alone. The model should only surface content it can cite to a specific AMM chapter, task card, or EASA/FAA regulation. If the source does not exist in the approved document set, the correct output is 'no approved data found'." She then adds: "Beyond architecture, human-in-the-loop review remains non-negotiable for any AI output that informs a maintenance decision. Certifying Engineers and Licensed Aircraft Maintenance Engineers working under Part 145 carry personal liability. Software providers building for this environment need to design for verification. The objective is a faster, better-informed human decision. Not an autonomous one." For Eric Schech, putting guardrails in place seems to be the order of the day as he believes that for any AI system used to provide technical maintenance information, the answer is not simply to tell the model to be more careful. He strongly believes that: "The software must limit what AI can see, what it can say, and—most importantly—what it is allowed to do. Such a system should retrieve from a controlled library of approved manuals and procedures associated with the applicable part, BOM item, aircraft, or work order. Every technical statement should cite the exact source and carry its revision, effective date, expiration status, and applicability. If supporting information is absent, expired, or conflicting, the system should stop and say it cannot verify the answer. Critical values should be checked through deterministic validation. AI output should never bypass required checklists, inspector approvals, customer authorizations, or mechanic and inspector sign-offs. Vista-Suite Enterprise's current capabilities are the surrounding workflow and control features—not AI-generated maintenance guidance. Those existing capabilities include expired-manual signals, job-close restrictions when manuals are expired, part-to-manual associations, locked attachments, linked squawks and non-routines, digital signatures, permissions, and time-stamped audit logs. These controls illustrate a broader industry principle: AI retrieves and drafts; software enforces rules; qualified people review and authorise; and the evidence remains available afterward."



Monica Badra, Founder & CEO, Aero NextGen, Inc

Should every AI-generated maintenance answer be traceable back to the approved source documentation, and how can software providers achieve this?

All three of our respondents here are in agreement, while Monica Badra at Aero NextGen is unequivocal in her answer with the aspect of traceability. "Yes, unconditionally," she says. "In a Part 145 environment, every maintenance action has a regulatory basis; AMM, CMM, SRM, AD, Engineering Order, or approved deviation. An AI-generated answer that cannot be traced to one of those sources carries no airworthiness standing. Software providers achieve this through retrieval-augmented generation architectures where the AI's response is explicitly grounded in a curated, version-controlled corpus of approved maintenance data. Each output should carry a citation: document title, revision level, section reference, and effective date. This is what any CAA or EASA audit will expect to see once AI tools become embedded in an approved maintenance organization's quality system. The practical implementation challenge is keeping the document corpus current. AMMs revise frequently; OEM service bulletins accumulate; fleet modifications change the applicable document tree. Providers who solve the version currency problem and give the maintenance organization full transparency into which documents were active in the corpus at the time an AI answer was generated will have passed the quality assurance gate."

Eric Schech is very much in line with Badra as he also agrees with the need for traceability back to approved source documents. He goes a little further though, commenting that: "Traceability must mean more than adding a link. The user should be able to see the exact manual or procedure, page and section, supporting passage, revision, effective date, expiration status, and applicability. If the system cannot produce that evidence, it should not present the response as an authoritative maintenance answer. Vista-Suite Enterprise does not currently generate this type of AI maintenance answer. It does, however, currently provide many of the underlying recordkeeping controls that illustrate what a governed information environment looks like: technical-manual storage, revision and date tracking, part and BOM associations, applicable manuals within work orders, expired-document signals, job-close restrictions, locked attachments, and user- and time-stamped audit history. More broadly, an industry AI system should preserve the question, documents retrieved, passages used, model version, generated response, user changes, and final approval. This is a design consideration for responsible AI across aviation maintenance—not a statement of current Vista-Suite functionality or a product roadmap."

For Scott Wells at MRO-PRO, he believes that "In a safety-critical maintenance

> ***"In a Part 145 environment, every maintenance action has a regulatory basis; AMM, CMM, SRM, AD, Engineering Order, or approved deviation. An AI-generated answer that cannot be traced to one of those sources carries no airworthiness standing."***
>
> *Monica Badra, Founder & CEO, Aero NextGen, Inc*

environment, an AI-generated answer should never be treated as an authority in its own right." He then goes on to say that: "The underlying data, maintenance requirement and, where applicable, approved source documentation must remain identifiable and traceable. That traceability has to be designed into the data architecture from the outset. We should not think of AI as a new source of truth; the structured maintenance data and approved documentation remain the source of truth. The role of AI is to interpret, analyse and identify relationships within that data. Software providers therefore need to structure their systems so that an AI-generated relationship, recommendation or answer can be traced back through the data that informed it. This becomes particularly important because maintenance data is highly fragmented. Different operators may derive their own approved maintenance programmes from the same OEM maintenance planning document, using different references, descriptions and structures. AI and semantic analysis allow us to understand the underlying maintenance intent rather than simply matching labels, but that relationship back to the originating maintenance requirement must be retained. For me, explainability and traceability cannot be features that are added afterwards. If AI is going to operate credibly in a safety-critical environment, they have to be fundamental properties of the underlying data architecture."

Can AI realistically predict non-routine findings before a heavy maintenance check and thereby improve planning, material availability and turnaround times?

One of the major goals and improvements that can be made to any aspect of aircraft maintenance is the transition from being reactive to proactive. AI has the potential to improve the proactive elements of MRO, and we wondered what inroads, if any, had been made in relation to heavy maintenance checks, as outlined by Tom Eskola, Vice President, Panasonic Technical Services at Panasonic Avionics as he confirms that: "Digitalisation in MRO is increasingly about using data- and software-driven insights to move from reactive maintenance towards more proactive and predictive approaches." He then explains further that: "At Panasonic Technical Services (PTS), we have already integrated capabilities including remote diagnostics, real-time monitoring, data-driven troubleshooting and proactive maintenance planning across in-flight entertainment and connectivity (IFEC) systems. AI will improve this ability and anticipate some non-routine findings before a maintenance event, although this will be an improving probability and preparedness rather than predicting every finding with certainty. The value comes from identifying potential issues earlier and connecting that insight to maintenance execution. PTS' Total Care Package can already include use of advanced diagnostics and predictive maintenance strategies as part of proactive IFEC maintenance, while recent PTS investments are designed to translate fleet-monitoring insights directly into real-time maintenance actions. As those predictive capabilities develop, earlier insight will give maintenance organizations more opportunity to plan the people, materials and capacity that's required and ultimately make turnaround times faster and more predictable."

For Guy Danon, Global Head of Sales and Marketing at Pentagon 2000 Software, Inc., much of this question comes down to the word 'predict' and its meaning in this context, though in principle he is inclined to the affirmative to a certain degree. He acknowledges that: "Today, AI cannot reliably tell an MRO that there is corrosion behind a specific panel on a specific aircraft before it is opened. What it can do is look at the history of that aircraft, the fleet and the type, and estimate which areas are likely to generate findings and roughly how much additional work to expect." He goes on to say that "If the history shows that a certain inspection on a certain type regularly leads to the same repairs, the planner can schedule that inspection earlier, and purchasing can check the availability of the parts and materials most likely to be needed before the aircraft arrives. That has a direct effect on turnaround time, because waiting for parts is one of the main causes of delay. The estimate is only as good as the records behind it, and the inspection still has to be done, so AI can support the planning without replacing the check itself." Meanwhile, Erkki Brakmann, CEO of Sky Select, Inc., also feels that "AI can predict many non-routine findings (NRF) before a heavy maintenance check by analysing data from different sources. By reviewing past records and market trends, machine learning models identify likely failure points before the aircraft arrives at the hangar. Although AI cannot predict random physical damage, it helps turn much of the previously unexpected work into planned tasks weeks in advance." He adds that: "This predictive capability improves material availability by generating automated procurement signals for long-lead parts before induction, helping prevent AOG part delays. For maintenance planners, it allows more accurate labour allocation. Ultimately, shifting from reactive firefighting to scheduled, parallelised repair routines can help MRO providers reduce overall heavy check turnaround times. However, AI currently serves as decision support rather than replacing regulatory physical inspections."

Tom Torosian, Director of Aviation Business Development at TruVideo, is of a like mind to many others in that "AI can meaningfully improve planning and material

> ***"Digitalisation in MRO is increasingly about using data- and software-driven insights to move from reactive maintenance towards more proactive and predictive approaches."***
>
> *Tom Eskola, Vice President, Panasonic Technical Services, Panasonic Avionics*



Tom Eskola, Vice President, Panasonic Technical Services, Panasonic Avionics

availability, but only to the extent it has real historical data to learn from." He then expands in this. "Most non-routine findings today are documented as free text or buried in photos that were never tagged to a tail number, ATA chapter, or prior work order, so the AI has nothing structured to match against. Where operators have started capturing visual evidence tied directly to the job and asset, we're seeing AI models get far more accurate at flagging likely findings before the check even starts. The prediction problem isn't really an algorithm problem, it's a data-capture problem. Solve the second one and the first one gets much easier." For Bethany Little, Chief Executive Officer at Veryon, there is no avoiding the limitations of AI. As she tells us, "AI can help teams anticipate some non-routine work by identifying warning signs in maintenance history before an aircraft enters the hangar. However, predicting every finding is a different proposition as some issues will only become apparent during a physical inspection. The practical opportunity AI enables is to reduce the number of surprises that teams find by giving planners earlier visibility of emerging problems so they can prepare labour, materials and investigation priorities by the time the aircraft reaches the hangar. Applied to pre-check planning, these insights can help teams identify areas requiring attention and assess likely part requirements earlier. The benefit of this is fewer avoidable surprises and better-informed turnaround planning. It's vital, however, that engineers still assess the evidence, determine the appropriate action and validate findings through the maintenance process. AI should not predict the inspection itself but instead interrogate the maintenance intelligence already available to narrow uncertainty before the aircraft enters the hangar. Our Veryon Defect Analysis solution addresses this by identifying, clustering and analysing recurring aircraft defects. On top of this, Veryon AIRE, our AI-driven intelligence layer embedded across our maintenance software suite, supports the identification and grouping of recurring defects, helping teams investigate patterns that might otherwise be difficult to spot. Fault-data integration and rogue-parts detection add context about recurring problems and potentially troublesome components."



Erkki Brakmann, CEO, Sky Select, Inc

How significant is the data-quality problem? Many operators have decades of maintenance information spread across different systems, formats and free-text records—can AI actually make effective use of it?

As the old saying goes, 'rubbish in equals rubbish out'. The 'problem' with AI is it requires data for training, so the more accurate and complete the data, the better the outcome. Of course, the obverse also applies! All five of our respondents here share the same thoughts in that AI has the potential to maximise the potential of historic data by helping to clean it up.

Guy Danon highlights the importance of complete data. "It is probably one of the biggest issues, because much of that history sits in old systems, or in unstructured formats, such as scanned documents, spreadsheets and technicians' free-text notes, often written differently by various people over many years. AI is good at reading this kind of unstructured information. Language models can interpret a free-text defect description, a scanned certificate or a PDF attached to an email and pull out the relevant details. In our own work with AI agents, the agents read incoming emails with their PDF, CSV or text attachments and turn them into quotes, sales orders and purchase invoices in the system. What AI cannot do is recover information that was never recorded. It can help flag inconsistencies, such as a part number that does not match the rest of the record, but someone still has to confirm the correct one. For that reason, we see two separate jobs: making better use of the history that already exists and, more important in the long term, making sure the records being created today are complete and structured, so the data is in better shape for the years ahead." For Erkki Brakmann, "The data-quality problem is huge because decades of maintenance records are trapped in separate systems, paper forms, and messy handwritten notes. Traditional software struggles with this, but modern AI excels at making sense of historical clutter. AI works like a skilled assistant: it translates mechanic jargon and typos into standard industry codes, scans old paper logs into searchable text, and links isolated databases together. While humans still need to verify critical missing safety information, operators do not need perfect data to get started: AI can deliver immediate insights from recent records while cleaning up decades of history in the background."

Tom Torosian also sees data quality as the biggest constraint to AI's usefulness. "It's the single biggest constraint on AI's usefulness in MRO today. Decades of maintenance history exist, but it's scattered across paper logs, PDFs, and free-text entries with no consistent structure, and a lot of the most valuable context (what a component actually looked like, what a technician saw during troubleshooting) was never captured at all beyond a verbal handoff. AI can help clean up and structure what already exists, but the bigger opportunity is fixing data capture going forward: timestamped, provenance-verified visual records linked to the work order as the work happens. That turns tomorrow's data into something AI can use, instead of creating the same unstructured backlog five years from now"

> ***"The data-quality problem is huge because decades of maintenance records are trapped in separate systems, paper forms, and messy handwritten notes. Traditional software struggles with this, but modern AI excels at making sense of historical clutter. AI works like a skilled assistant..."***
>
> *Erkki Brakmann, CEO, Sky Select, Inc*



Tom Torosian, Director of Aviation Business Development, TruVideo

> ***"In aviation specifically, 'AI' without traceability isn't just a marketing problem—it's a liability problem, since nothing in this industry gets trusted without a clear chain of evidence behind it."***
>
> *Tom Torosian, Director of Aviation Business Development, TruVideo*

he comments. Bethany Little raises an interesting point when she describes how "Two technicians may describe the same underlying issue differently, while evidence of a recurring problem may be spread across logbook entries, aircraft faults, component history and previous corrective actions." She then goes on to explain how the problem was dealt with. "That was the original challenge Veryon Defect Analysis was built to solve — traditional machine learning and natural-language processing, reading "spoiler," "splr" and "spoileron" as the same part instead of three unrelated strings. That approach built something no competitor has: fifteen years of real engineer decisions — approve, split, merge — captured every time a technician reviewed a suggested chronic. What's changed is what sits on top of that foundation. Our Next Generation Defect Analysis pairs that fifteen-year dataset with generative AI through Adaptive Clustering — not a replacement for the deterministic model, but a fusion with it. Generative AI is genuinely better at language: parsing intent, handling variation. The traditional model is still better at holding consistent, repeatable output, which matters in a regulated, safety-first industry. Adaptive Clustering also incorporates ongoing feedback from an operator's own maintenance team, so the system adapts without an engineer having to manually rebuild the math every time — review and confirm, instead of rebuild. Rogue-parts detection adds further context on potentially troublesome components, , and Defect Analysis works alongside third-party maintenance and engineering systems rather than requiring operators to rip and replace. AI can also make fragmented maintenance histories more useful, but it does not remove the need for good data management. It cannot recreate information that was not captured in the first place, or make fundamentally incorrect source information accurate, so the quality of the underlying data still matters."

Tom Eskola is adamant that "Data quality is fundamental to whether AI can provide useful support in a maintenance environment." He then advises that "To produce effective insights, an AI platform needs draw on reliable and traceable information, and maintenance organizations need to understand which data has informed a recommendation, how consistently the system performs and where its limitations lie. This is particularly important in aviation, where strong validation, traceable data, configuration control, cybersecurity and human oversight are essential. AI does not remove those requirements - if anything, it makes strong governance more important. AI will increasingly aid organizations in navigating large volumes of legacy maintenance information, including records held across different systems and formats, but it cannot make poor-quality or incomplete data reliable by simply processing more of it. The value will therefore depend not only on the sophistication of the AI, but on the quality, traceability and context of the information available to it. For maintenance organizations, getting those foundations right is just as important as the technology itself."

How should an airline or MRO distinguish a genuinely valuable AI capability from a conventional software product that has simply added "AI" to its marketing?

Where MRO is concerned, is AI all hype; more a case of style over substance? Have we ended up with software which achieves exactly the same results but comes in a new shiny wrapping? We wanted to hear from the 'shop floor' what the true feeling was now that there has been time to reasonably assess the genuine impact of AI on software used for operational procedures.

"If you want to tell real AI apart from traditional software with a new label, check whether the system can handle unstructured data and improve its predictions over time, rather than just following set rules," says Erkki Brakmann. "Real AI turns data into useful insights on its own, while older software only digitizes fixed processes and needs you to clean the data first. In the end, true AI shows its worth in a proof-of-concept by spotting complex patterns to predict future needs and unexpected results, not just by sorting existing information," he adds. The advice from Tom Torosian is straightforward, with some sound advice. "Ask what the AI's output is actually tied to," he suggests, and follows up with: "Genuine capability produces something explainable and defensible, a recommendation or summary that traces back to specific, timestamped evidence tied to an asset and work order, so a technician or auditor can verify exactly why the AI said what it said. If a vendor can't show you the evidence trail, you're likely looking at a language model wrapped around existing features rather than a tool built for a safety-critical, audit-driven environment. In aviation specifically, 'AI' without traceability isn't just a marketing problem—it's a liability problem, since nothing in this industry gets trusted without a clear chain of evidence behind it."

"The starting point should be the role the AI plays within the maintenance workflow," is the approach Bethany Little favours. "A valuable AI capability should be to identify useful patterns, bring relevant information together or support the completion of a meaningful task. It should also improve the way a maintenance team investigates an issue or makes a decision," she continues, before adding that "Operators should look closely at the data the AI is built on, how its outputs are validated, and whether it has

been developed specifically around aviation maintenance rather than simply applying a generic AI interface to an existing product. Veryon AIRE is our AI and data intelligence layer, built on a verified foundation: the industry's largest de-identified aviation maintenance dataset, curated maintenance outcomes, and machine learning tuned by aircraft make and model. That foundation runs underneath our full product suite, most recently, Defect Analysis, so the agentic layer sits on top of real maintenance data rather than a generic interface wrapped around an existing product. On top of that foundation, your Veryon AIRE's Assistant gives teams a conversational way to investigate issues and surface recommendations. In Defect Analysis specifically, AIRE now also works behind the scenes to help identify and group recurring defects. Every suggestion, regardless of where it surfaces, still runs through human review before it's actioned. Veryon AIRE enables users to reference information across Veryon products from within their existing workflow, helping teams connect a maintenance issue with relevant information held elsewhere in the platform. The practical test of any AI capability is whether it makes a real maintenance task easier, faster or more informed. If it produces an impressive response without actually improving the underlying workflow, its operational value is limited."

Where Tom Eskola is concerned, he sees "...AI's near-term role as supporting qualified professionals rather than replacing their authority, particularly in safety-critical maintenance. A useful capability needs to operate within a clearly defined use case, be supported by reliable and traceable data, and have clearly understood limitations."



Guy Danon, Global Head of Sales and Marketing, Pentagon 2000 Software, Inc.

He also feels that "The other important test is whether the insight can actually be translated into maintenance action. An AI-generated alert has limited value if it does not reach the right team, is not supported by reliable evidence, or cannot be connected to an appropriate maintenance response. The real opportunity comes from linking data, diagnostics, technical documentation and maintenance execution. Faster fault isolation, more effective access to technical information, and better maintenance planning may be less headline-grabbing than autonomous maintenance, but they can deliver much more practical value. Well-governed AI integrated into existing workflows is likely to create significantly more value than an impressive looking, but ultimately standalone demonstration. For an airline or MRO, the simplest test is therefore whether the AI capability demonstrably improves the maintenance outcome. If it adds complexity without improving the way the work is performed, the label itself has very little value."

Guy Danon makes a very valid point when he clarifies what he feels distinguishes between the two forms of software, in other words: "... whether the software can actually reason, or whether it only follows rules that someone configured in advance." He backs this up by adding that "Many products labelled as AI are still rule-based automation, such as a fixed template, a keyword search or a predefined report, which works until an email arrives in a different format or someone asks a question the report was not built for. A genuine AI capability understands what is being asked in the context of the business, works out which information it needs and how to analyse it, and handles variation without someone setting up a new rule each time. For example, when a manager asks which vendors the company spent the most with last year, the AI has to identify the relevant data, decide how to calculate the answer and explain what it found. Beyond that, ask what the AI actually does in the daily work. A useful AI capability works with the company's own data and completes real tasks, such as creating a purchase invoice from a vendor's email, matching it to the purchase order and receiver where they are available, and passing it to the right person. The next question is whether it follows the same rules as the rest of the system. In aviation, an AI agent should work with the same business logic, approval flags and user permissions as the person who would normally do the task. If a user cannot see or approve something, the AI working on their behalf should not be able to either. Finally, it should be clear what the AI did. When it answers a question, users should be able to see which data it used and the logic it followed. When it creates a document, the team should be able to open the original email and attachment from the record, and when it could not complete a task, the reason should be clear, for example, a customer that does not exist in the system."

If we visited an aircraft maintenance organization in 2030, what task that is routinely performed manually today would you be surprised to still see a human doing?

With a great deal of talk about the potential for AI to make many roles redundant, it would be short-sighted not to look at areas within MRO operations where manual tasks could be superseded by AI-driven software solutions. We wanted to know if any particular roles have already been identified as being vulnerable from those involved at the rock face.

Guy Danon at Pentagon 2000 Software looks at the situation from two different perspectives. First, he comments that: "I would be surprised to still see the same information being written several times by different people. Today, when a technician raises a finding, they describe it on a card. A planner then turns that description into a parts requirement, someone in the commercial team rewrites it as a quote for

> ***"We do not want AI to replace people, but rather to support them and their productivity. Moreover, the industry is already short of experienced maintenance staff. With the expansion of the drone and space sectors, the demand for skilled employees will only grow."***
>
> *Guy Danon, Global Head of Sales and Marketing, Pentagon 2000 Software, Inc.*

the customer, and the customer often asks for more detail before approving. Each step is a person re-reading and re-entering what someone else already wrote. By 2030, I would expect the finding to be captured once, with the technician's notes, photos and measurements, and for AI to prepare the parts request, the customer quote and the explanation of the work from that single record, for the right people to check and approve. We already see this approach with our own AI agents in PENTAGON AVENTUS, which read customer and vendor emails and prepare quotes, orders and invoices in the ERP for the team to review, and we expect the industry to extend it to the hangar floor over the next few years." He then adopts a very logical approach to the situation as he concludes that "We do not want AI to replace people, but rather to support them and their productivity. Moreover, the industry is already short of experienced maintenance staff. With the expansion of the drone and space sectors, the demand for skilled employees will only grow. The technician, the planner and the commercial team should be able to spend their time making smarter, AI-enabled decisions that need their know-how and technical expertise." By 2030 Sky Select's Erkki Brakmann feels that "... most manual airframe inspections and routine maintenance planning will be automated, but people will still play a key role in both the hangar and the back office. AI will collect data and create work packages, while technicians will handle complex repairs and tech ops leaders will keep making strategic decisions. Since regulations require clear accountability, AI will support the process, but certified engineers will still have the final legal responsibility for safety sign-offs and airworthiness approvals."

Tom Torosian at True Video has exactly the same opinion as Erkki Brakmann when it comes to the irreplaceability of experienced technicians, though he acknowledges that some processes will become easily streamlined. "I'd be surprised if remote troubleshooting were still happening primarily over a phone call or a Teams chat with no retained record. Today, a technician on an AOG event describes what they're seeing to an SME verbally, a decision gets made, and then the entire exchange. The visual evidence, the reasoning, the fix evaporates the moment the call ends. By 2030 that should be unthinkable; it's one of the easiest gaps to close with existing technology. What won't go away by 2030, and shouldn't, is the hands-on judgment of an experienced technician. AI will get better at flagging patterns, but the physical diagnosis and final call will still belong to a person—AI's job is making sure that person's expertise gets captured and reused instead of walking out the door when they retire," he says. Where Bethany Little at Veryon is concerned, she sees one of the influences of AI as being on the actual role of individuals and how they carry out their tasks. She tells us that: "In 2030, it would be surprising to still see skilled technicians spending significant time manually piecing together the evidence around a recurring aircraft defect – scrolling through logbooks, cross-referencing parts history, trying to remember if they've seen this one before. That work shouldn't belong to a person anymore. Software should be doing the preparation: retrieving the relevant records, assembling a draft summary, populating the routine documentation for a technician to review rather than build from scratch. Technicians should be spending that reclaimed time evaluating evidence and doing the actual maintenance – not transcribing it. The human role will always remain essential. By 2030, engineers should spend less time gathering and typing up information, and more time on diagnosis, judgement and verification. Maintenance decisions and sign-off stay exactly where they belong – with appropriately authorised personnel. The goal was never to remove people from maintenance decision-making. It's to build the technology that supports them – cutting the time spent manually gathering information, so teams have more of it to apply their judgement, experience and expertise."

It seems that Tom Eskola at Panasonic Avionics shares similar thoughts with other contributors in terms of how AI can help existing employees and how job roles may change as a result. However, rather than concentrating on redundancies, he sees AI helping to improve the quality of information available to decisionmakers. "By 2030, it would be surprising to see a qualified maintenance technician spending significant amounts of time manually searching through multiple maintenance manuals, service bulletins and troubleshooting procedures simply to locate the information relevant to the task in front of them. We already see a clear opportunity for AI-supported systems to make technical information easier and faster to navigate. An engineer should be able to ask a direct question and receive a focused response linked to the relevant approved documentation, including the source and current revision. The aim is not to replace the source material or the engineer's judgement, but to put the right information in front of the technician when it is needed. What should not disappear is human judgement. Physical maintenance, complex troubleshooting and safety-critical decisions will continue to require qualified professionals working within approved procedures. With this in mind, AI's immediate role should be supporting those professionals rather than replacing their authority, with the greatest value coming from improving everyday maintenance execution. By 2030, we should therefore expect machines to be doing much more of the searching, sorting and prioritizing of information, allowing technicians to spend more of their time on the work that genuinely requires engineering experience, judgement and accountability."

> ***"The goal was never to remove people from maintenance decision-making. It's to build the technology that supports them – cutting the time spent manually gathering information, so teams have more of it to apply their judgement, experience and expertise."***
>
> *Bethany Little, Chief Executive Officer, Veryon*



Bethany Little, Chief Executive Officer, Veryon