AviTrader
AVIATION NEWS PUBLICATIONS

MRO

Aerospace Magazine

avitrader.com | Edition #118
January 2024

Parts Quality

Overseeing the airworthiness for previously utilized aircraft parts

Aircraft Transitions
Minimize the challenges of aircraft returns

Give it a wash
Changing trends in aircraft washing technology

Dents and Buckles
Measurements and recording simplyfied

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20th Anniversary of AviTrader

Dear readers,

This year, we celebrate the 20th anniversary of AviTrader. We founded AviTrader in 2004 when the internet was still in its infancy. Up until that point, news from the aviation industry was primarily disseminated to readers through printed materials, postal services, or fax. Our journey has been a tremendous success, with our news being read daily by thousands of readers.

We have come a long way since our inception, and we are proud to have played a significant role in bringing aviation news to a wider and more accessible online audience. As technology has evolved, so have we, and we continue to adapt to meet the needs of our readers in the ever-changing aviation landscape.

We would like to take this opportunity to express our gratitude to our dedicated readers, contributors, and partners who have been instrumental in our success over the past two decades. Your continued support motivates us to strive for excellence in delivering timely and relevant aviation news. A special thanks goes to our loyal advertising clients who make it possible for us to provide our publications to our readers for free.

Thank you for being part of our journey.

Peter Jorssen
Publisher

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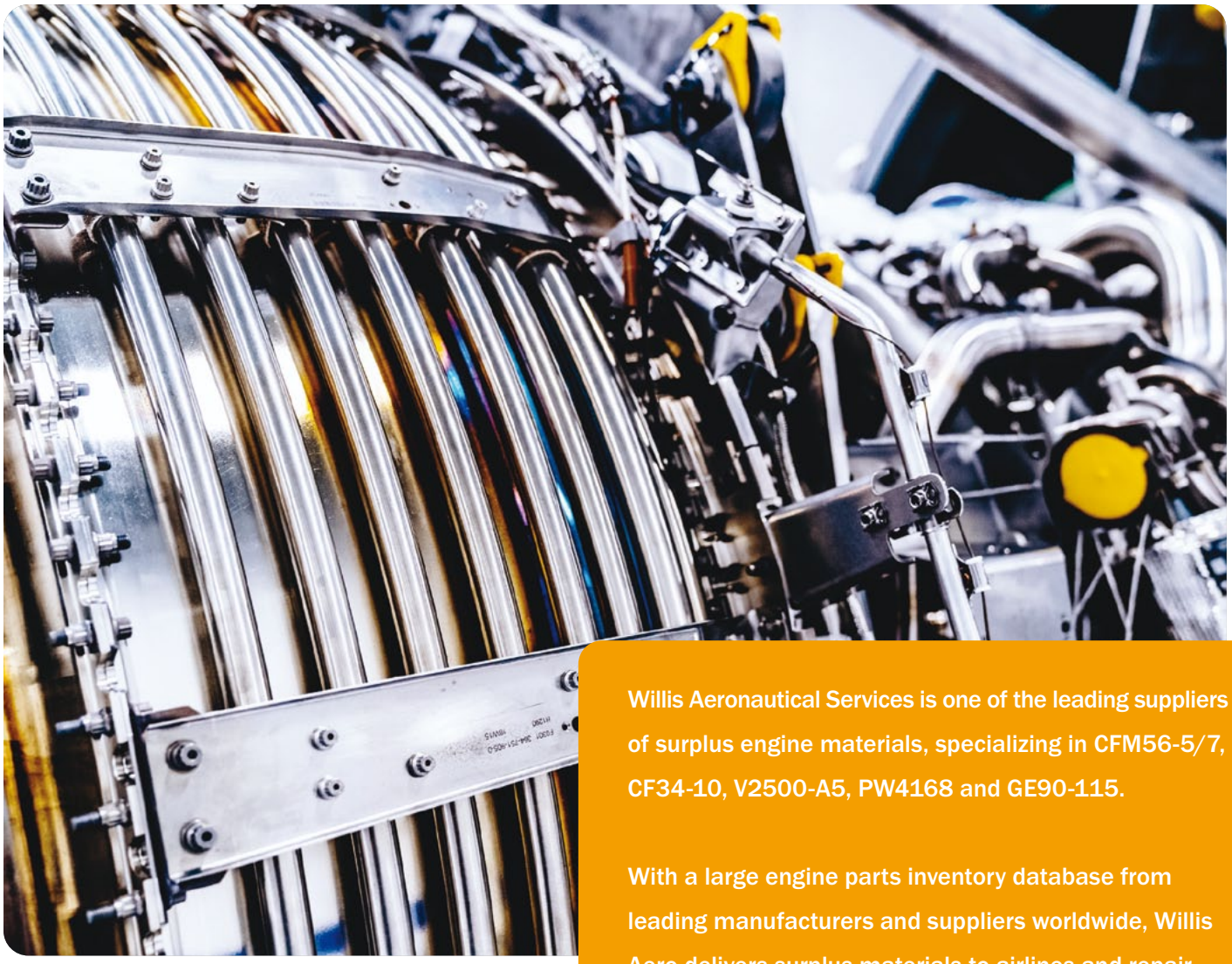

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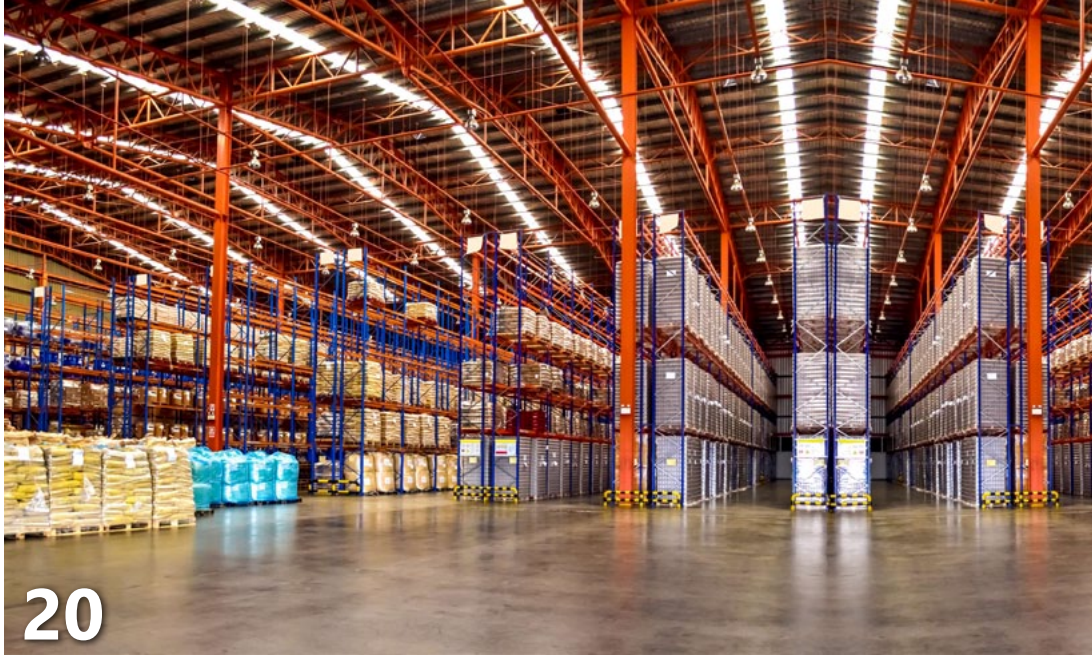
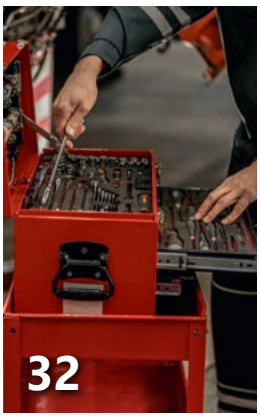


USM – The Attractive Alternative to Factory New



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PTC Industries and Nasmyth sign MoU to integrate supply chain solutions

PTC Industries (PTC) and Nasmyth have signed a memorandum of understanding (MoU) for collaboration to leverage their capabilities for offering global solutions to defence and aerospace customers in India and globally. The MOU will see Nasmyth and PTC work together in support of the 'Make in India' Atamnirbhar Bharat programme leveraging each other's capabilities. This cooperation will help PTC expand its capabilities to better support Indian customer requirements and successfully execute those projects. The partnership will focus on developing casting, machining, assembly and thermal precision engineering capabilities in India. The collaboration will help to increase capacity in the market, signal a move towards vertically integrated supply chain solutions in India and in turn provide global solutions to OEM's looking for suppliers to de-risk their current supply chains while providing capacity growth opportunities. PTC has a state-of-the-art manufacturing campus in Lucknow and is one of the world's leading suppliers of high-precision metal components for critical and super-critical operations across the aerospace and defence industries. PTC is currently participating in various programmes requiring components, sub-assemblies and assemblies for various defence, land, sea and air platforms and is also working on a number of major projects for the Indian Government and for a growing number of global OEM's. Nasmyth Asia's new manufacturing facility in Bangalore, offers turnkey manufacturing and engineering solutions that exceed the highest industry standards offering bespoke machining services including assembly and system integration.

Official signing of the MOU between Nasmyth and PTC © *Nasmyth*

VoltAero chooses Safran electrical wiring to equip Cassio 330 certification aircraft

Safran Electrical & Power has been selected to supply the electrical wiring on VoltAero's Cassio 330 electric-hybrid certification aircraft, confirming Safran's role as a leading partner in VoltAero's clean-sheet e-airplane. With this contract, Safran Electrical & Power will design and produce electrical wiring for the propulsion system and power distribution system – in particular, the high-voltage wiring – on the Cassio 330 to be utilised in the certification programme of this first member of VoltAero's aircraft family. The wiring will be qualified for power ratings up to 800 Volts in continuous operation and is to be designed to resist partial discharge phenomena at altitude. At the equivalent size of cabling produced today for traditional aircraft, the Cassio wiring will carry power levels twice as high. "The electrical wiring is a critical element of our Cassio aircraft and we've selected Safran Electrical & Power based on the company's expertise – particularly at high power levels," explained Jean Botti, VoltAero's CEO and Chief Technology Officer. "This marks another important step toward the Cassio 330's certification and service entry." Safran Electrical & Power will provide its technical expertise to support VoltAero in obtaining the SOF (Safety of Flight) validation – a pre-requisite for carrying out the Cassio 330's certification flight tests. This contract extends a partnership signed in 2020 involving the Cassio 330's electric-hybrid propulsion system. Safran Electrical & Power is to supply the propulsion system's ENGINeUS 100 electric motor, which delivers a maximum power of more than 150-kW at take-off. The ENGINeUS 100 integrates its own control electronics as well as an air-cooling system, ensuring an optimal size-to-power ratio.

IAI to maintain PW4000 engines for ATSG

Signing ceremony between IAI and ATSG © *IAI*

Israel Aerospace Industries (IAI) Aviation Group has signed a long-term contract under which it will maintain and service PW4000 engines for Air Transport Services Group's (ATSG) leasing company, Cargo Aircraft Management (CAM). The PW4000 engine maintenance will be carried out at IAI's Bedek MRO division's facilities, a world centre of knowledge in the field, and one of the world's leading MRO facilities. IAI offers state-of-the-art engine MRO services through its team of highly trained and experienced engineers, advanced repair processes, coupled with the latest technologies, test cells, and cutting-edge laboratories for investigative services, providing its customers with long-term excellence, reliable and serviceable engine support. ATSG has a long-standing relationship with IAI as they have converted more than 150 Boeing 767 aircraft. This newly signed contract is evidence of the depth of the cooperation between IAI, ATSG and CAM. This contract illustrates the value that ATSG places on its relationship with IAI as it continues to deliver industry leading services to its U.S. and global leasing customers.

Crane Company acquires Vian Enterprises for US$103 million

Crane Company (Crane) has acquired Vian Enterprises, Inc. (Vian) for approximately US$103 million on a cash free and debt free basis. Founded in 1968, Vian is a global designer and manufacturer of multi-stage lubrication pumps and lubrication system components technology for critical aerospace and defence applications with sole-sourced and proprietary content on the highest volume commercial and military aircraft platforms. Through August 2023, it is estimated that Vian had trailing 12-month sales of approximately US$33 million and adjusted EBITDA of approximately US$8 million, with an order backlog exceeding US$100 million. Crane financed the acquisition primarily with proceeds from its revolving credit facility. Crane's President and CEO, Max Mitchell, said: "We are very excited to announce this transaction. Vian is highly complementary to our Fluid Solution within the Aerospace & Electronics segment, significantly expanding our portfolio of mission-critical aerospace flow control products. Vian has strong positions on the most attractive commercial and military aircraft platforms today and combined with our existing fluid and thermal management capabilities, further strengthens our positioning for future content opportunities on engines, gearboxes and auxiliary power units. We expect that Vian's margins will be accretive to the Aerospace & Electronics' segment EBITDA margins immediately, with a long-term sales growth rate in line with the segment's previously disclosed 7% to 9% long-term CAGR. Vian, along with the other acquisitions that we continue to pursue, meets our clearly defined strict financial and strategic acquisition criteria." Crane will provide further updates on the Vian acquisition during the fourth quarter earnings call. (£1.00 = US$1.26 at time of publication).

GKN Aerospace boosts sustainable manufacturing with £50 million investment in Sweden

GKN Aerospace has strengthened its commitment to sustainable manufacturing by investing £50 million (600 million SEK) in cutting-edge additive fabrication technology in Trollhättan, Sweden. The Swedish Energy Agency's Industriklivet initiative will contribute £12 million (152 million SEK) towards this investment, aimed at transforming production methods and reducing raw material usage by up to 80%. The new technology will be integrated into GKN Aerospace's Trollhättan facility in Sweden and is set to become operational later in 2024. Currently, aircraft engine components rely on extensive castings and forgings, resulting in up to 80% of the material being machined away before achieving the final form. By employing additive technology, which involves constructing layer-by-layer using metal wire or powder fused together with lasers, GKN Aerospace can significantly reduce raw material wastage, energy consumption and shipping within the production process. This approach leads to substantial reductions in emissions, costs, and lead times. GKN Aerospace has been at the forefront of additive fabrication for nearly two decades and maintains significant research and technology centres in Sweden, the UK, and the U.S. Thanks to the support from Industriklivet, the new additive production centre in Sweden is expected to create approximately 150 new job opportunities for operators, technicians, and engineers at the Trollhättan facility. Peter Engdahl, Head of Research, Innovation and Business Development at the Swedish Energy Agency said: "GKN Aerospace's solution will be able to contribute to a reduced use of raw materials and create opportunities to fundamentally change the design, making the aircraft engine lighter and more efficient. This is the first time this technology is being tested for this component size and we see the potential for it to spread globally and also in other areas."

© GKN Aerospace

ExecuJet MRO Services Australia prepared to service Falcon 6X

Training on a Falcon 6X aircraft *© ExecuJet MRO*

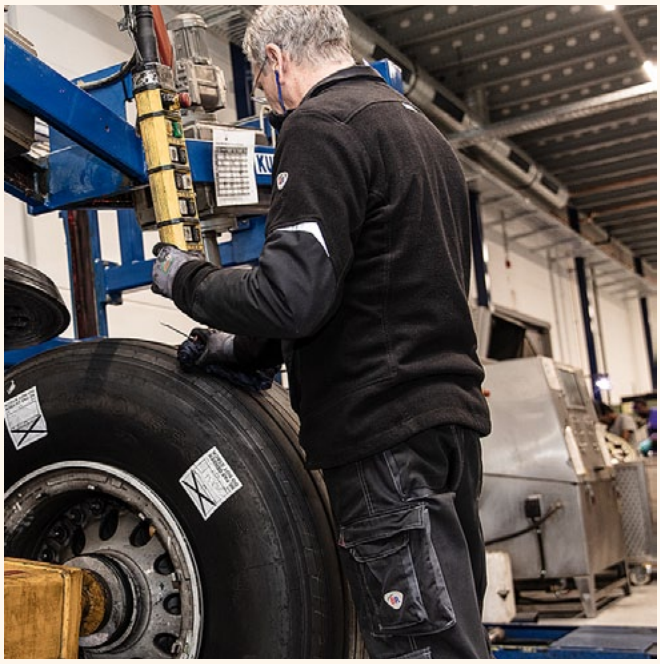
The Falcon 6X, an innovative addition to the Falcon family known for its spacious cabin, is now in service, and ExecuJet MRO Services Australia (ExecuJet) stands ready to provide comprehensive support. ExecuJet's engineers have successfully completed maintenance training accredited by the European Aviation Safety Agency (EASA). This rigorous training programme spans six weeks, encompassing four weeks of theoretical instruction and two weeks of hands-on practical training on the 6X assembly line. This training equips engineers to offer top-notch line maintenance services for 6X aircraft in Australia and the Pacific region. Jason Jia, a licensed aircraft maintenance engineer at ExecuJet, travelled from Australia to Bordeaux, France, where he completed the EASA-certified training course. The theoretical component took place at CAE, an international aviation training organisation in Bordeaux, while the practical training occurred at the Dassault Training Academy, also in Bordeaux. Notably, the Dassault Training Academy operates as an EASA Part 147 training organisation. The training comprehensively covered all systems of the Falcon 6X, including engines, avionics, the digital flight control system, fuel system, hydraulics, landing gear, lighting, water and waste systems, structures, CNS (communication, navigation, surveillance), electrical systems, cabin furnishing and connectivity, oxygen systems and the auxiliary power unit. Jia commented, "It's clear that Dassault took the opportunity to include the most modern systems for maintainability and troubleshooting through the FalconScan diagnostic system. It provides maintenance engineers an integrated and in-depth tool to isolate faults and test the system."

Artemis Aerospace opens new hubs in Florida and California

© Artemis Aerospace

Global aviation component solutions specialist Artemis Aerospace has opened two new hubs in the U.S. Located in Miami, FL and Los Angeles, CA, Artemis' stateside hubs will streamline orders and deliveries for U.S.-based customers and provide a quicker and even more efficient service. The company, which was established in 1999 by Jim and Deborah Scott and has headquarters in the UK, operates a global, solution-led service. Its flexible approach has earned the company an enviable reputation across multiple disciplines, including component supplies, component repairs, lessor support, flight simulation hardware support, consignment stock management and global aircraft logistics. Jim Scott, Owner, Co-Founder and Managing Director of Artemis Aerospace, stated: "This marks a new chapter for Artemis as we strengthen our global offer. Combined with our establishment of U.S. banking facilities for the convenience of U.S. customers, our new hubs will guarantee that we can continue to provide the highest quality service across the Americas, shorten delivery times and offer quick and convenient solutions."

TP Aerospace Czech Republic receives EASA approval



© TP Aerospace

The new wheel and brake maintenance and warehouse facility from TP Aerospace in the Czech Republic is officially open after final audit. By the end of 2023, the German LBA (Luftfahrt Bundesamt) performed the final audit for the new site in Czech Republic. The audit was passed without any findings. This means that TP Aerospace's new EASA Part-145 approval includes the new site in Brno. Last year, TP Aerospace established a new wheel and brake maintenance and warehouse facility in Czech Republic. The 10,000 m² building in Brno is the new flag-ship facility in TP Aerospace's network with a fully equipped maintenance shop with an expected annual capacity of 15,000 repairs and overhauls. "I'm extremely proud that we have been able to set up a fully equipped MRO and warehouse facility of this size in record time. We now have the capacity to welcome even more customers and ensure that we continue to be the best wheel and brake partner to our customers", says CEO Nikolaj Jacobsen. In the first quarter of 2024, a grand opening is planned to take place to introduce the new shop to customers and investors and celebrate this milestone for TP Aerospace.

321 Precision Conversions earns EASA approval for A321-200PCF

A321-200PCF interior

© 321 Precision Conversions

321 Precision Conversions has reported that the European Union Aviation Safety Agency (EASA) has granted approval for the A321-200 freighter conversion (A321-200PCF) FAA STC ST02716SE. This certification further affirms the excellence of Precision Conversions' design and allows for the operation of the A321-200 freighter conversion on crucial European routes. 321 Precision Conversions has already secured approvals from Chinese and Malaysian authorities for its FAA STC. The fully supported A321-200PCF surpasses all expectations, providing (14) A-Code 88 x 125-inch main deck positions and (10) ULD positions in the lower hold when equipped. This enhanced capability is achieved by reducing the operating empty weight (OEW) instead of necessitating costly weight upgrades. The absence of permanent ballast installation results in reduced fuel consumption, a smaller carbon footprint, and an increased standard payload. The A321-200PCF holds certification for V2500 and CFM engines with multiple thrust ratings. 321 Precision Conversions is a collaborative effort between Aircraft Transport Services Group and Precision Aircraft Solutions, dedicated to delivering the A321-200PCF freighter conversion worldwide. Precision Aircraft Solutions, known for setting the global standard for B757-200 conversions, continues its tradition of industry-leading passenger-to-freighter cargo conversions with the A321-200.

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Aircraft dent and buckle checks simplified

New digitalised inspection technology replaces manual measurements and recordings.

An airplane was hit by a strong hailstorm. A thorough investigation now begins to determine the damage to the aircraft, assess its airworthiness and thoroughly document the damage. If no clear and complete documentation is guaranteed, there may be lengthy "negotiations" about the extent of the damage, at the latest when there is a change of ownership or operator. AviTrader spoke with Leonard Buck from 8tree and Christian Roulin from AMROS Global about how new digital tools are helping to assess and document aircraft structural damage.

AviTrader MRO: **Christian and Leonard, what are your experiences with the assessment of dents and buckles and what problems can arise when returning an aircraft?**

Christian Roulin: Basically, assessments on an operational aircraft are conducted under time pressure. Consequently, it is often seen that the documentation quality needed for a lease return or an airworthiness inspection is not fulfilling the required standard. This leads to double efforts on the maintenance side obtaining the undocumented information or conducting a complete re-assessment or repair replacement to fulfill the standard. The negative aspect of such an activity is, on one side, the extra/double costs, but on the other as well the reduction of the asset when a repair is to be replaced due to further oversized attachment installations.

> **“This partnership is an asset for everyone in such a project, and the customer can directly benefit from it.”**
>
> *Christian Roulin, AMROS Global*

Leonard Buck: Our customers keep telling us that dent-mapping is very time-consuming. The more dents you face, the more tedious it gets. With the ever-


Christian Roulin, AMROS

Performing a leading-edge scan with the dentCHECK tool
© 8tree

rising workforce shortage in the industry, especially the aftermarket, companies seek solutions to max out their workers' time on the shop floor. Digital tech can help to improve productivity here.

AviTrader MRO: **8tree offers its "dentCHECK as-a-Service". What is behind it and what distinguishes you from the competition?**

Leonard Buck: Our dentCHECK tool solves the daily challenges AMTs face on the shop floor. Time-consuming, error-prone, and tedious dent-mapping. With the push of a button, dentCHECK delivers instantly actionable measurement results of dents and other damages. No post-processing, no surface preparation. Under the umbrella of dentCHECK-as-a-Service and together with our industry partners, we enable MROs and Airlines to benefit from dentCHECK on a project basis. No CAPEX overheads for the customer. Our team flies out to support your aircraft transition or hail damage mapping project on a fixed price per panel basis.

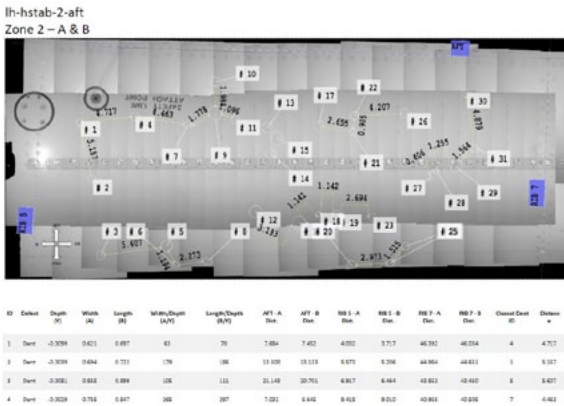
AviTrader MRO: **As a technical service provider and CAMO organization, you are often involved in assessing damage to the aircraft. You work together with 8tree and are cooperation partners. What are your experiences with "dentCHECK as-a-Service".**

Christian Roulin: It is an absolute asset partnering with 8tree since 8tree, as the OEM and developer of the tool, will assist with in-depth know how on the application possibilities not limited to the use of the measuring equipment but as well the use of the reporting software. This partnership is an asset for everyone in such a project, and the customer can directly benefit from it.

AviTrader MRO: **The damage is stored digitally. Is this data made available to the owner of the aircraft and the maintenance companies ahead of time?**

Leonard Buck: It all depends on the individual case and customer needs. We are in the business of helping. In some cases, we only deliver digital damage reports; in other cases, we also cover the engineering part, including OEM-communication. Ultimately, the customer receives all results captured during the damage assessment.

Leonard Buck, 8tree



Large-area scan result from a hail-damaged stabilizer
© 8tree

Christian Roulin: A well-maintained structure damage/repair file and its dossiers, including all the needed supporting documents, can be shared with any organization at any time.
If desired and when the Publication Management and the IT infrastructure of the CAMO organization allows it, such files can be published transparently at any time.

AviTrader MRO: **Your service is offered worldwide. How is the order typically placed?**

Christian Roulin: We are globally present and have subsidiaries in Europe and Asia. Orders typically come in directly to our respective sales teams and response time is usually within 15 minutes with on-site presence in less than 24 hours. Need a specific solution that requires careful planning? We are reachable via hello@amrosgroup.aero or contact us on LinkedIn.

Leonard Buck: Get in contact, and we will figure it out! We are excited to hear from you.

> **“Our dentCHECK tool solves the daily challenges AMTs face on the shop floor.”**
>
> *Leonard Buck, 8tree*

Aircraft in hangar
© *Shutterstock*

Reducing the Headaches of Aircraft Transitions

The True Value of Effective Aircraft Transition Management

By David Dundas

The phase-out, phase-in, including lease returns of aircraft often cause headaches for all parties involved. In an aircraft transition, often three parties are involved: the airline returning the aircraft, the airline looking to integrate the aircraft into its fleet, and in many cases, the owner of the aircraft, typically an aircraft leasing company, and other stakeholders such as civil aviation authorities, maintenance providers, engineering, supply chain and logistics, etc.

Even when everything is detailed in leasing contracts, including the overall condition of the aircraft, the status of components, etc., conflicts of interest still exist during a transition. The leasing company and the future operator aim to take over a perfect aircraft, while the transferring airline intends to return the aircraft without any unplanned additional maintenance costs. And the aircraft return should occur without any delays. Furthermore, all aircraft documentation must be reviewed.

We spoke to three experts in the aircraft transition management field to find out how to ensure there is a smooth aircraft transition that is on time, and which avoids unforeseen expenses.

The effects of COVID-19 on the aircraft transition workload.

The drastic effect of the COVID-19 pandemic on air travel saw many carriers forced to return aircraft that were on lease. This clearly led to a massive increase in the workload for those operating in the field of aircraft transition management. What we wanted to find out is whether much of this increased workload was farmed out or if in-house transition management specialists were able to absorb the increased demand for their services.

Eirtech Aviation Services based in Shannon, Ireland specialise in dealing with outsourced aspects of aircraft transitions and the company noticed that many airlines and leasing companies were able to choose whether or not to partially or fully outsource certain aspects of the aircraft transition process as a consequence of the dramatic increase in aircraft transactions. Adrian Lynch, Technical Development Manager at Eirtech Aviation, commented: "Outsourcing helps the airlines and lessors manage increased workloads efficiently, especially during times of uncertainty and rapid changes in fleet composition. During current and past COVID periods every company is victim to rapid changes of staff availability so engaging a third-party service provider like Eirtech Aviation ensures risk mitigation in such circumstances."

FL Technics, part of the Avia Solutions Group is very much in concurrence with

A well prepared transition eliminates lengthy negotiations © *Shutterstock*

Eirtech on the matter. The company has noticed that unlike airlines, lessors tend not to have internal transition teams, so there has been a surge in demand as a result of the COVID-19 pandemic. Ruslan Knysh, head of the sales unit in the Engineering Department at FL Technics notes that: "The surge in outsourcing requests has been significant, driven by a substantial volume of aircraft returns resulting from decreased flight frequencies among airlines. In navigating these transitions, lessors have found it necessary to engage external Continuing Airworthiness Management Organization (CAMO) services to oversee aircraft airworthiness, secure appropriate maintenance, and parking slots, and effectively manage the supply of crucial aircraft parts," adding that, " This shift in the industry emphasizes the dynamic nature of aviation operations during challenging periods and underscores the strategic role of external expertise in ensuring a seamless and efficient aircraft transition process."

Similarly, AMROS Group noted that while carriers had their own in-house CAMO and maintenance capabilities, during the period of increased workload lessors would subcontract the CAMO and maintenance activities. Giovanni Renga, AMROS' CTO, pointed out that: "With the COVID pandemic putting pressure on resources, we also see material managers for aircraft transitions on a regular basis. It happens, and this is a core speciality of AMROS; that the entire transaction, that means that the full aircraft transition work scope is outsourced (e.g., Project/Program Management, Stakeholder Management, Material management, records management, ground time supervision, etc.) from start to end including the transfer of the title of the aircraft."

> **"With the COVID pandemic putting pressure on resources, we also see material managers for aircraft transitions on a regular basis. It happens, and this is a core speciality of AMROS."**
>
> *Giovanni Renga, CTO, AMROS*

Recent changes in strategies and best practices

AMROS Group believes that frequently used aircraft reach their delivery date yet are a long way off being ready for the actual transition. This would appear to be even more common where a fleet change is planned, yet the company is keen to point out what a best-in-practice phase-out / phase-in cycle needs. Among many other things, the recommendation is to begin with a strong management programme which clearly defines the roadmap, the milestones, the deadlines, who the stakeholders are, and what resources are available, etc. AMROS also highlights the importance of records' preparation, the majority in accordance with IATA guidelines. Needed resources are identified as CAMO, engineering, asset management, logistics, MRO, etc. One of the biggest changes that has come about through advancements in today's technology has been the development of aircraft management software to improve the overall efficiency and speed of aircraft transitions, which helps to reduce costs through fewer on-site visits, efficiency gains and time saving.

FL Technics Ruslan Knysh also points out how the digitization of aircraft documentation has heavily influenced the aircraft transition process, stating that: "In contemporary scenarios involving

Giovanni Renga, CTO, AMROS Group

Workscope discussion

© *Shutterstock*

the acceptance of an aircraft in a distant location, the need to deploy a five-to-six-member engineering team for on-site document verification within a constrained timeframe has been rendered obsolete. This crucial process can now be efficiently conducted remotely, leveraging electronic copies of the requisite documents."

Adrian Lynch at Eirtech Aviation was keen to focus on the importance of safety and regulatory compliance and how the industry has refined its approaches to ensure that aircraft transitions adhere to relevant aviation regulations. "This includes working closely with CAMO organisations and aviation authorities by adopting best practices to meet safety standards. Close collaboration and maintaining good relationships with the National Aviation Authorities can help minimise last minute regulatory challenges when an aircraft needs to be exported or imported into different regulatory jurisdictions."

Adrian Lynch, Technical Development Manager, Eirtech Aviation Services

Lynch also goes on to highlight the increasing emphasis being placed on sustainability and environmental considerations. "Nowadays, there is a growing emphasis on sustainability and environmental considerations. Airlines and leasing companies are incorporating greener initiatives in their fleet acquisition and disposal strategies, such as retiring older less fuel-efficient aircraft and introducing more environmentally friendly variants. Airlines are exploring short-term leases, sale-leaseback arrangements, and adjusting fleet sizes and types based on demand fluctuations and market conditions. This also creates the shape of the upcoming future aircraft transitions playing field."

Enhancing efficiency through technology and data-driven solutions

While there is recognition of digitization of aircraft documentation as a game-changer for the aircraft transition process, AMROS' Giovanni Renga feels too many stakeholders still rely on paper records and Excel spreadsheets. He acknowledges that: "more and more complete transition management tools are getting introduced and used like LISA Aircraft Records Management." He adds: "There do exist tools now with AI and ML functionalities (such as LISA), which are optimized for aircraft records and transition management, reducing transition workload enormously by making use of Artificial Intelligence and Machine Learning. Furthermore, LISA offers integration into the leading

> **"Almost all airlines and operators now work with digitized data but there is a gap in standardisation of the process across the industry."**
>
> *Adrian Lynch, Technical Development Manager, Eirtech Aviation*

> **"Navigating negotiations and finding mutually acceptable solutions is key to ensuring a smooth and cooperative transition process for all parties involved."**
>
> *Ruslan Knysh, Head of the Sales, Engineering Department at FL Technics*

M&E (maintenance and engineering) system AMOS by Swiss-AS, making data accessibility, review and management much more efficient, creating never-seen-before cost savings."

Adrian Lynch at Eirtech points out that: "Airline CAMO and Technical departments normally use an approved predictive maintenance and engineering (M&E) software platform to forecast maintenance tasks due to ensure the aircraft remains airworthy and regulatorily compliant. These platforms are being constantly improved by their development teams and many of these players are part of industry ATA Working Groups helping each other bring their products become fully ATA SPEC-2500 capable and compliant."

Lynch adds that "Almost all airlines and operators now work with digitized data but there is a gap in standardisation of the process across the industry. Basically, if all operators used the same data naming conventions for the (SPEC2500 mandatory) columns and rows within whichever M&E system used, then this would be a big first step in implementing ATA SPEC-2500 worldwide as the standard in transitioning aircraft records between owners and operators."

He concludes: "The effects of such an achievement would be that the aircraft records should always be in a redelivery standard condition (subject to bespoke lease contract provisions) and then with the press of a button on the M&E system the data can be exported out as an ATA SPEC-2500 compliant XML format digital crate which can be easily onboarded into the next operator M&E system. This will save a huge amount of time and cost for the next operator to onboard their newest aircraft into the M&E system."

Ruslan Knysh at FL Technics talks about the importance of departing from online spreadsheets and the creation of task-specific software. "At FL Technics, we introduced our bespoke software, OILS.aero, dedicated to the meticulous management of record discrepancies. This innovative platform facilitates seamless communication among stakeholders concerning identified issues with aircraft documents and their physical conditions. By departing from conventional reliance on various online spreadsheets, a strategic decision was made to develop a specialized IT tool for the management of open items, resulting in the creation of OILS.aero. The success of this software is underscored by its adoption among other leading airlines, lessors, and CAMO organizations, for the optimization of their respective projects."

Ruslan Knysh - Head of Sales, Engineering Department at FL Technics

Landing gear inspection © *Shutterstock*

How experts and professionals can contribute to successful transition management

In relation to the role of experts in aircraft transition management, FL Technics refers to its parent company Avia Solutions Group and how a manager needs to be able to anticipate a project's potential problems. These could range from prolonged lead times for parts' supply to the requirement for complex maintenance work, as well as the lack of essential documentation. Ruslan Knysh sums up the project manager's role very succinctly: "Equally important is the project manager's ability to demonstrate effective communication skills when

Aircraft successfully transferred

engaging with the counterparty. Navigating negotiations and finding mutually acceptable solutions is key to ensuring a smooth and cooperative transition process for all parties involved."

Adrian Lynch at Eirtech understands, very clearly, that there is a crucial role to be played by project management professionals in the aircraft transition field as they bring with them specialized knowledge, skills, and industry insights that contribute to a successful outcome. Some of these skills and experience include conflict resolution, legal and contractual considerations, and specific aircraft type technical knowledge. He points out that: "By being adept at identifying potential risks associated with aircraft transitions they can conduct thorough risk assessments, develop mitigation strategies, and help organizations navigate uncertainties effectively, hence minimizing delay disruptions and associated extra costs."

He is also very clear on the value of highly skilled professionals in the area of aircraft transition management. "Technical experts provide critical support in evaluating the physical condition of an aircraft, overseeing maintenance activities, and ensuring that the aircraft and the maintenance records meet the required standards. Engaging experienced external professionals is often seen as an investment in achieving a smooth and successful aircraft transition. With the right people engaged, their contributions can add huge value at various stages of the process, ensuring that the transition is well-managed and resourced, regulatory compliant, cost-effective, and aligned with the organization's strategic goals."

AMROS' Giovanni Renga has concerns over the lack of resources and know-how available post the COVID-19 pandemic. He also notes that the level of airlines' internal resources for aircraft transitions tends to fluctuate. They will build up an asset management transition department for a transition, but after the delivery/redelivery of the aircraft, the skills required disappear, frequently for cost reasons, so that at the next transition project cycle, the skills and resources need once again to be built up, creating a continuous cycle of lack of know-how. He sees the biggest challenge faced by aircraft owners is: "that most of their staff are contracted staff, often leaving the "hands-on" expertise entirely with their suppliers. In the worst cases, these are individuals with little experience with regards to maintenance programmes, aviation legislation and regulation, and especially maintenance processes. It becomes immediately apparent who has practical experience from working on an aircraft, and those who have learned everything from textbooks. These factors can result in considerable financial losses for both the airlines and lessors."

It is clear that effective aircraft transitions rely heavily on a smooth transaction with minimal disruptions and delays. Any deviation from this will end up being costly, and more often than not for lessees returning a plane to the lessor at the end of the lease agreement. Undoubtedly there is tremendous value in effective aircraft transition management and that is why this area of the industry is home to some of the most knowledgeable and experienced professionals, and why there is a genuine need for businesses which specialise in aircraft transition management.

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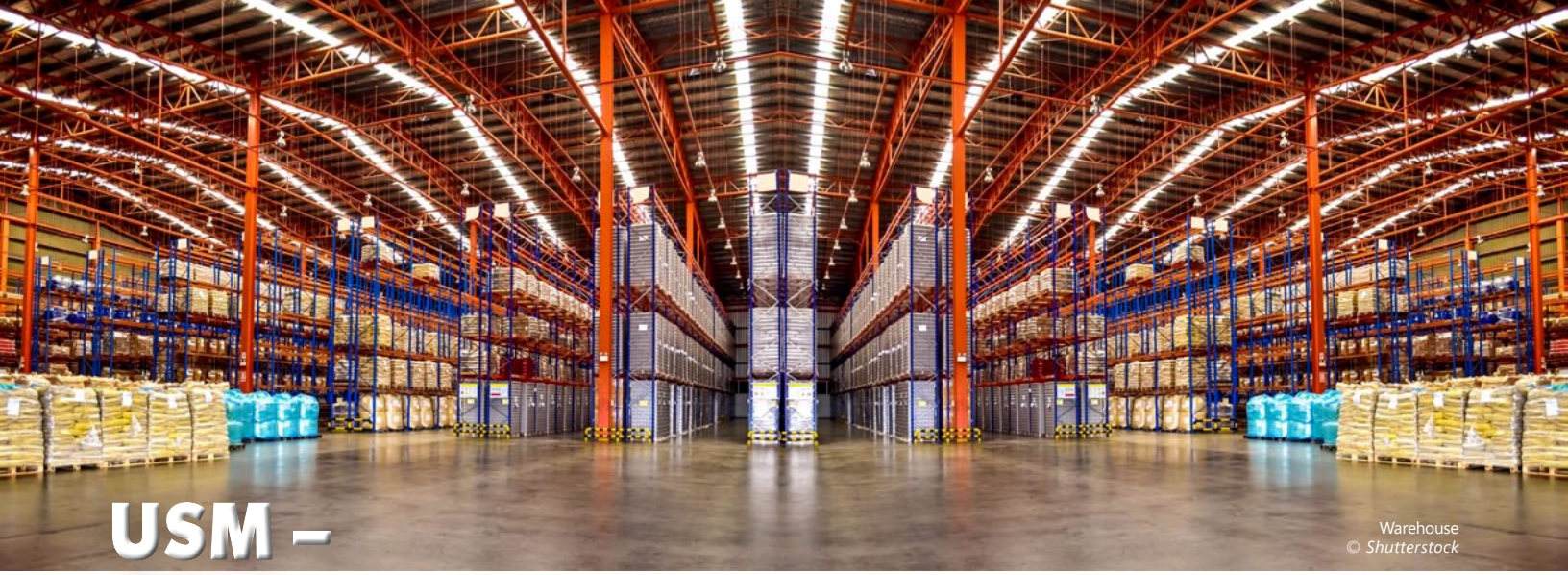

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USM – The Attractive Alternative to Factory New

In Light of the AOG Technics Scandal, What is Being Done to Ensure the Quality of USM?
By David Dundas

Our industry is highly regulated by authorities and internal company rules to ensure the safety of aircraft at all times. Every task of an aircraft mechanic, and all components of an aircraft, are meticulously documented. The mechanic must rely on the fact that the installed used parts comply with all regulations and are airworthy. The recent scandal surrounding AOG Technics demonstrates that there is a criminal element who will look to find loopholes to circumvent regulations and deceive unsuspecting buyers. The situation involving this London-based company which is accused of providing jet-engine parts with counterfeit documentation has led to the grounding of nearly 100 aircraft. Regulators and airlines are still evaluating the extent of this problem, which could encompass thousands of airline parts distributed by AOG Technics.

AviTrader has spoken with various experts from the industry on how they ensure that all components, especially used ones, and their certificates comply with regulations, and their responses are highly reassuring in an industry where safety is at the root of all actions and processes.

Some airlines seem reluctant to install USM or restrict its use to non-critical parts. We wanted to find out why this might be the case.

The overall consensus is that airlines do not necessarily need to be wary of using USM, primarily because of the strict regulations that help to mitigate safety risks. In the opinion of Max Lutje Wooldrik, Founder & CEO – APOC Aviation: "By ensuring rigorous certification processes, enhancing traceability, and maintaining strict quality control, USM can be a reliable and cost-effective option for aircraft maintenance, without compromising safety or operational efficiency."

Simon Walker, SVP Technical, AerFin feels that the company's customer base will show that the number of airlines restricting the use of USM has fallen over the past two decades. He feels this is because airlines get accustomed to installing USM and are more accepting of the additional technical and trace paperwork that it brings about. However, he does note that: "There will be times when airlines only install new for certain parts or specific critical areas of the aircraft. This could be driven by the reliability or durability of a part that may only be demonstrable by installing new parts and consequently ensuring the technical integrity for that function of the aircraft."

Michael Garcia, VP Commercial, Kellstrom Aerospace accepts that where airlines are concerned, there is no room for compromise in any aspect of the maintenance cycle to the point where some airlines exercise caution or limit the use of used serviceable materials (USM) to non-safety-critical parts. Kellstrom also recognises the significance of prioritizing

> ***"There will be times when airlines only install new for certain parts or specific critical areas of the aircraft."***
>
> *Simon Walker, SVP Technical, AerFin*

Simon Walker, SVP Technical, AerFin

Jim Maguinness, Quality Manager - EirTrade Aviation

> **"Just because an asset has been retired, doesn't mean that its parts have lost their value or can no-longer be used, in fact it's just the opposite."**
>
> *Jim Maguinness, Quality Manager, EirTrade Aviation*

safety. Garcia comments that: "Airlines, driven by various key performance indicators (KPIs), particularly focus on reliability, where the association of 'new' with warranty and extended life cycles holds sway among consumers. Kellstrom addresses these concerns by not only partnering with OEMs for product distribution but also engaging in the aftermarket repair network, delivering a cost-effective, just-in-time solution. Our commitment to maintaining rigorous testing and quality standards, akin to OEM manuals, ensures the reliability of USM."

Jim Maguinness, Quality Manager, EirTrade Aviation feels that the attitude of airlines is very much based on a misconception, stating that: "just because an asset has been retired, doesn't mean that its parts have lost their value or can no-longer be used, in fact it's just the opposite. All aircraft components, new or used, require regular maintenance to ensure that they meet all material regulations set forth by the aviation authorities."

One valid reason raised to explain airlines' reluctance to use USM comes down to one word, trust. Trust that the carrier has in its USM parts supplier. However, Kevin Flynn, Sr. Director of Quality and Operations, VAS Aero Services strikes a positive note: "I believe that overcoming an operator's fears of using quality USM parts comes down to the trust that operator has in their USM parts supply partner and the demonstrated quality control processes that vendor has put in place to assure that USM replacement parts are both airworthy and have the proper pedigree ensuring they are approved parts. The economics of USM utilization versus OEM parts procurement (and associated supply chain backlogs) make a compelling case for USM, to be sure."

We wanted to know what were considered key factors for airworthiness when sourcing USM.

Responses have made it very clear that ensuring safety and operational efficiency are critical when considering using USM. Consequently, it is vital that a comprehensive assessment of the materials' integrity, previous usage history, adherence to industry standards, and compliance with regulatory requirements is carried out to ensure their suitability.

David Miret Mora, Technical Director, AJW Group refers us to: "The current Parts 21J and Parts 21G regulations, for example, [which] establish the certification procedures and requirements for the design, production, and airworthiness of aviation products. The main purpose of these regulations is to ensure products meet stringent safety and quality standards before they are put into service." He adds that: "This is vitally important in maintaining the integrity of the aviation industry and safeguarding the well-being of all stakeholders. When using USM material, the same principle is applied, therefore the USM quality and airworthiness should be equal or higher."

Max Lutje Wooldrik at APOC Aviation remarks that proper storage and handling history are essential to maintain part integrity and support the decision-making process for their use in aircraft maintenance. He further explains: "When sourcing and inspecting used aircraft materials, it is crucial to verify their traceability and certification to ensure they meet airworthiness standards. Inspections must assess the part's condition, life limit, and compatibility with the aircraft. The

David Miret Mora - Technical Director, AJW Group

> ***"The main purpose of these regulations is to ensure products meet stringent safety and quality standards."***
>
> *David Miret Mora, Technical Director, AJW Group*

supplier's reputation, the existence of warranties, regulatory compliance, and a thorough cost-benefit analysis are also vital considerations."

When Simon Walker at AerFin was asked, he advised that: "The Key factors that end users routinely demand is integrity of the paperwork – where and who has operated that part, how as it been removed, is there a clear audit trail from the removed aircraft to the repair shop and what specific repairs have been performed for the recertification and restoration of its airworthiness. It is worth noting that end users and airlines keep approved vendor lists to ensure USM is being repaired at trusted repair shops which are routinely audited and have a robust quality management system so airlines can be confident of the reliability of the subject part being installed."

At Kellstrom Aerospace, priority is assigned to establishing a trustworthy partnership. Michael Garcia makes it clear that: "Consumer confidence in used serviceable materials (USM) hinges on the assurance that these parts have been handled by extensively trained professionals, adhering to all relevant manuals and stringent quality standards. The possession of correct and up-to-date manuals, coupled with a vetted high-quality system, becomes pivotal in the decision-making process for sourcing USM. Here at Kellstrom as a supplier with over 40 years of experience, ensuring a dependable track record and maintaining exceptionally high-quality standards, helps to instil utmost confidence in the supply chain network."

Shipping area. © *Shutterstock*

Very much along the theme of trust, VAS Aero Services suggest that it pays to know what training certificates and repair/inspection/quality credentials the USM vendor's personnel possess, advising that a reputable USM parts vendor will readily supply this information. Kevin Flyn mentions that: "There are several key factors that should be considered. First is understanding the history of the part and expectations for its current condition. What is the origin of the part? Is there a clear ownership chain? What is the operational history of the part and what environmental stresses was it subjected to? What was the original projected life span of the part and where in that lifecycle is it? What is the maintenance history? Are all the part's traceability and maintenance documentation acceptable? Secondly, what inspection procedures has the part been subjected to? For some non-safety-critical parts, simple visual inspection by a qualified technician is sufficient

Michael Garcia, VP Commercial at Kellstrom Aerospace

> ***"Consumer confidence in used serviceable materials (USM) hinges on the assurance that these parts have been handled by extensively trained professionals."***
>
> *Michael Garcia, VP Commercial, Kellstrom Aerospace*

to determine its current condition. For other, more flight-critical materials, more advanced diagnostic tests and repairs may be required, based on the OEMs CMM or AMM, in which case a visual inspection is not enough. Has the quality, condition and serviceability of the material been certified, and by whom? VAS algins itself with proven suppliers that are continually monitored to ensure exceptional product quality and on-time delivery."

EirTrade Aviation stresses the importance of a back-to-birth tracing assessment being carried out on the USM. "This is crucial for the inspection process and for our team to assess the quality and airworthiness of the material, and only then will they be eligible for the aftermarket. The components must have an Airworthiness Release Certificate from an approved maintenance organisation," Jim Maguinness advises.

"In addition to this, the aviation authorities require that airlines and MROs have a robust vendor approval procedure in place. Suppliers should have an independently audited quality system specific to aircraft parts supply, such as, ASA-100, TAC2000, ISO 9001 2015 or a national standard. Airlines should audit and monitor their suppliers for compliance with their own requirements, which may differ from the industry standards," Maguinness added.

We also wanted an opinion on what the industry standards and best practices to follow were when dealing with USM in order to maintain safety and quality

Avion Express, part of the Avia Solutions Group, sources new and USM only from approved suppliers. Aistis Urbonas, VP Technical at Avion Express underlines that: "Quality and safety are the most crucial and decisive factors in the aviation industry,

Bearings © *Shutterstock*

and they unquestionably encompass the evaluation of any aircraft material. All USM is individually checked to ensure it meets the mandatory EASA requirements. Moreover, every team member is appropriately trained for their role, ensuring a high standard of safety."

David Miret Mora at the AJW Group is very clear with his ideas. "A comprehensive model that integrates safety, quality, and reliability is essential. Each element is crucial not only for regulatory compliance but also for effectively mitigating safety risks. Additionally, it is important to closely monitor reliability aspects to ensure the end product, if using used serviceable material (USM) aligns closely with the expected lifespan of new materials."

Strictly following regulatory guidelines is top of the list for Max Lutje Wooldrik, APOC Aviation's CEO. This, he says, can be assured through thorough documentation and certification of used serviceable materials and the implementation of robust quality assurance programmes, pointing out that inspections and testing of USM for integrity and compatibility are essential, alongside maintaining a detailed traceability system. He adds that: "at APOC, we believe a risk management framework, ethical sourcing practices, and strong supplier relationships are also critical for safety. Additionally, customer transparency and a commitment to continuous improvement are key to upholding industry standards and best practices for maintaining quality and safety with USM."

EirTrade Aviation highlights that as an AFRA-accredited company, it adheres to the AFRA Best Management Practices (BMP) Guide for disassembly and recycling of aircraft, parts, and materials, pointing out that this is the leading standard for dismantling aircraft in a safe, efficient, and environmentally friendly manner, and meets its clients' ESG requirements.

Quality Manager, Jim Maguinness comments: "EirTrade provides a live report to customers which provides full transparency of the components removed from the aircraft at any point in time during the disassembly process. We also comply with the ASA-100, TAC2000, and other systems that are based on the Federal Aviation Administration (FAA) AC-0056, which establishes a voluntary industry distributor programme. With regard to packing and transportation, removed parts are cleaned before being packaged in ISPM-15 standard crates for transport to accredited MRO specialists or put into stock."

Kevin Flynn at VAS Aero Services was very clear in his company's policy. "A robust, reliable, and dependable USM

> **"Every team member is appropriately trained for their role, ensuring a high standard of safety."**
>
> *Aistis Urbonas, VP Technical, Avion Express*

Max Lutje Wooldrik, Founder & CEO, APOC

provider will follow the guidelines of FAA AC 00-56B, ASA 100, AFRA, and other ISO, AS/EN9100 series programs that set necessary quality requirements for the aviation industry. Additionally, any refurbishment that may be required should be performed by specially trained technicians and certification conducted by authorized and credentialed specialists who's repair station has capabilities to perform those repairs and functions."

Flynn added that "In addition to its airworthiness certificate, the USM part must be accompanied by complete traceability back to an approved source, an airline as an example, and repair history documentation. To paraphrase the movie line, 'show me the documents'. Only then can a USM part be deemed airworthy and confidently be returned into service as a needed replacement."

And finally, we wanted to know what common challenges were faced when verifying the authenticity and condition of used aircraft materials, and how these challenges can be addressed.

Max Lutje Wooldrik at APOC Aviation makes it clear that common challenges in verifying the authenticity and condition of USM include ensuring traceability, preventing counterfeit parts entry, and accurately assessing wear and tear. "These challenges can be addressed by implementing stringent inspection protocols, utilising advanced technology for part verification, maintaining meticulous records, and working with trusted suppliers. At APOC our staff have regular training on counterfeit recognition and compliance with international standards, such as those from the FAA and EASA, which are also essential elements in maintaining the integrity of the USM supply chain," he explains further.

VAS Aero Services' Kevin Flyn admits that determining the origin of a part can be difficult at times, pointing out that, depending on its age and location, an individual aircraft may pass through several operators/lessors prior to being removed from service. He states that: "Knowing who handled the dismantlement of an aircraft from which the USM part originated is beneficial, too. Are they a certified MRO or up to date with the AFRA BMP as examples to ensure proper methods, training and tooling is used? You'll want to work with a teardown and parts harvesting specialty company that is careful about "crossing all the T's and dotting all the I's." A diligent, best-practices-focused USM partner will take the steps necessary to provide a complete ownership and maintenance history of the materials – from source to condition to airworthiness certification."

He also ended with some sage words: "Assuring authenticity and condition of USM parts is really all about the art of documentation and making sure that all documentation accompanies the purchased materials. An experienced USM parts provider knows what to look for and where, and how to connect the dots through proper documentation."

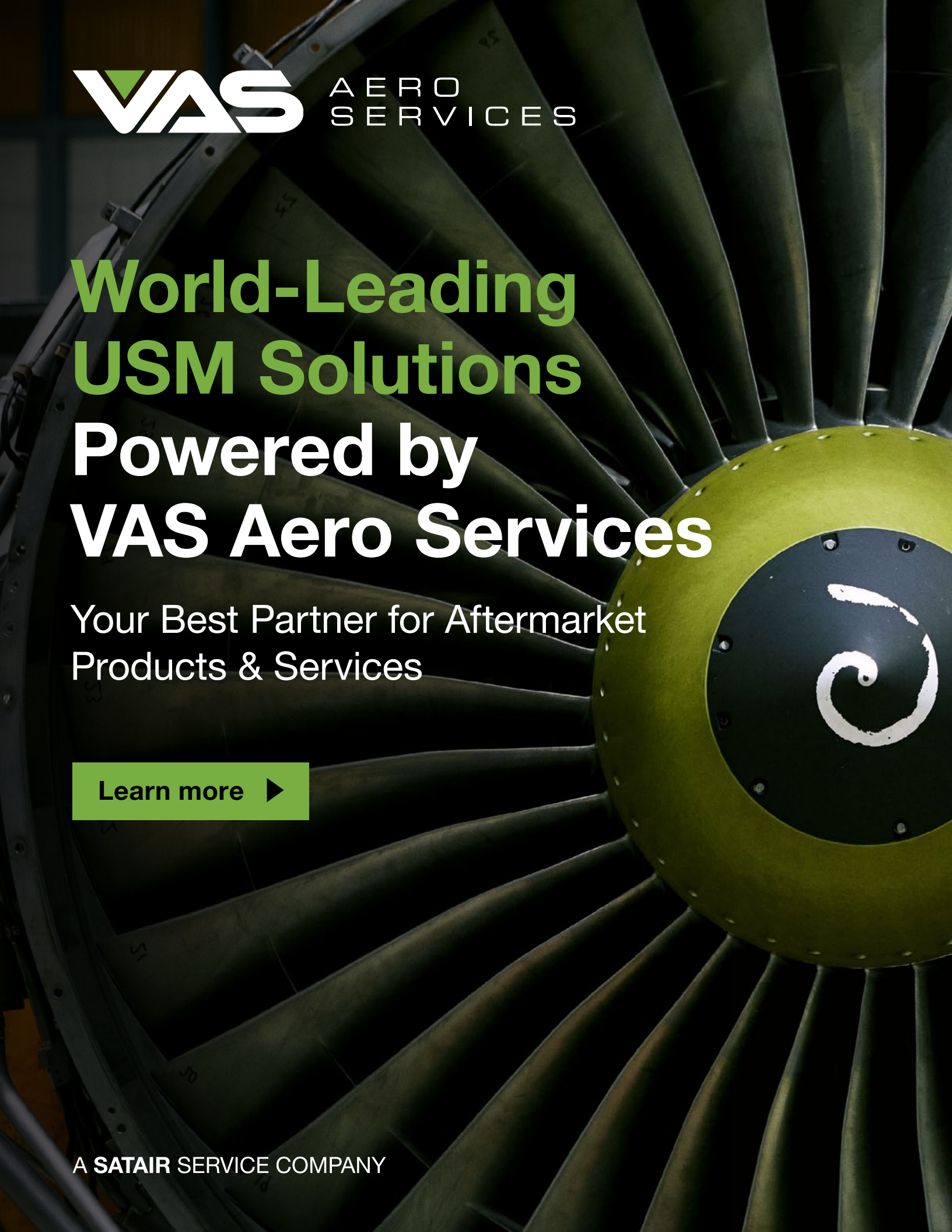
EirTrade offer words of caution in advising that parts that are offered on the market which are not from an approved source are a threat to safety, so it is imperative that unserviceable parts are segregated from serviceable parts. The company makes it clear that parts that cannot be made serviceable in accordance with current maintenance data must be quarantined and/or put beyond use in a manner that ensures they cannot be used. However, Jim Maguinness ends on a positive note. "Vendor evaluation, performance monitoring, and supplier accreditations should ensure that the supply chain is secure."

AJW Group's David Miret Mora also adopts a cautious approach to the challenges. "To address these challenges clarity is crucial. A standardised industry format, similar to EASA Form 1 or FAA 8130, would enhance transparency by facilitating easy identification of work undertaken and materials replaced. Encouraging collaboration and information sharing among industry stakeholders can further establish best practices for material identification and reporting, thereby leading to a more reliable system."

His solution comes in the form of one word – clarity – which he feels is crucial. "A standardised industry format, similar to EASA Form 1 or FAA 8130, would enhance transparency by facilitating easy identification of work undertaken and materials replaced. Encouraging collaboration and information sharing among industry stakeholders can further establish best practices for material identification and reporting, thereby leading to a more reliable system."

From all the above responses, it is difficult to see what more could be done not only to ensure the quality of USM, but also its authenticity. A combination of highly experienced staff, robust operating systems, and opaque traceability 'back to birth' of aircraft parts are clearly crucial.

> ***"Assuring authenticity and condition of USM parts is really all about the art of documentation."***
>
> *Kevin Flynn, Senior Director of Quality and Operations, VAS Aero Services*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Aircraft undergoing drywash
© *Emirates*

Give it a wash

Changing trends in aircraft washing technology

By Swaati Ketkar

Next time, before boarding an aircraft, take a casual glance at the spick and span, glossy and shiny aircraft exterior. Most of the time, our attention is focussed on the aircraft interior, the carpets, cushions, our aircraft seat, etc., for tidiness and cleanliness, as we pay little heed to the aircraft's exterior surface, simply taking for granted that it will be clean.

But, just like cleaning our bikes and cars, aircraft washing and cleaning is a very important part of aircraft maintenance. Let us understand its importance and how technology has evolved over time from this being a manual to semi-manual process, gradually drifting towards a fully automated one.

Have you ever given a thought as to what an aircraft has to go through during the course of a flight? The air surrounding the aircraft contains dirt, dust, sticky smoke, smog, exhaust residue, particulate matter like incompletely burned hydrocarbons, sulphur oxides and black carbon often called soot. Unburned or partially combusted hydrocarbons, also known as VOCs, along with various gases like carbon dioxide, water vapour, nitrogen oxide, and carbon monoxide which react with the chemicals with the above pollutants corrode the aircraft's exterior.

Apart from the above, there is the pressurisation cycle, turbulence and removal of various inspection panels that can damage the aircraft's paint or exterior fuselage.

Aircraft washing is a necessity for efficient, sustainable flight

A clean aircraft exterior projects a picture of efficiency, safety, and success while promoting

confidence in the aircraft and the airline. When asked about some of the most basic advantages of aircraft cleaning, Veronika Andrianovaite, the chief commercial officer at Nordic Dino Robotics AB listed the following points – "Safety, lower fuel consumption, extended paint life, fewer corrosion issues, and environmental sustainability." She further

Nordic Dino WB Robot washing the wing of an aircraft.
© *Nordic Dino Robots*

elaborated her point by highlighting the negative environmental effects of a dirty aircraft resulting from the impact on aerodynamics. "Increased aerodynamic drag requires more fuel to reach and maintain the needed speed and altitude. This results in higher fuel consumption, which increases an unwanted environmental footprint," Andrianovaite adds.

Echoing Andrianovaite's thoughts, Ove Trøen, chief executive at Avinxt adds: "A clean aircraft doesn't only look amazing when you board your next flight, it is scientifically proven that the cleaner the aircraft, the less drag it produces in the air." Thus, a clean aircraft ensures that it uses less fuel, thereby emitting less carbon in line with current sustainability initiatives. Trøen further elaborates his point with the help on an example. "Calculations made by Boeing and Airbus show that if you clean your planes regularly i.e., every three weeks, you may save up to 2% in fuel consumption and carbon emissions. So clean aircraft are a win-win for the airline's cost and the environment," Trøen adds.

Adding to the above list of advantages, Dr Ashwani Khanna, executive director at AeroTech Support Services elaborates on the advantages with more factors like an enhanced company image and exuding a sense of safety. A clean fuselage also helps with ease of detection of any visual signs of flaws, helping maintenance staff to take prompt corrective action.

> ***"A clean aircraft doesn't only look amazing when you board your next flight, it is scientifically proven that the cleaner the aircraft, the less drag it produces in the air."***
>
> *Ove Trøen, CEO Avinxt*

How often is an aircraft washed?

Looking at the above advantages, you may ask if an aircraft is washed after every flight. Although the aircraft's interior is thoroughly cleaned after every flight, it is unnecessary and not cost-effective to wash an aircraft on the outside after every flight. So, how often is the exterior of an aircraft washed?

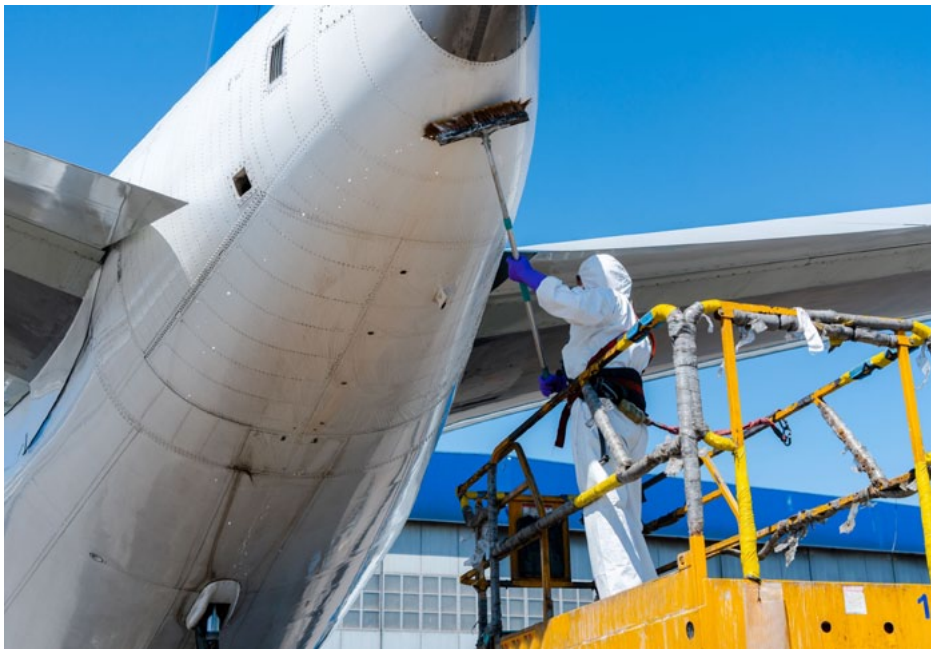
Typically, every airline has its own cleaning schedule for specific aircraft types and will take into account additional factors like frequency of flights and the

environment in which the planes operate. The schedule is normally in sync with the A or B maintenance checks, but many planes are also regularly washed and cleaned to maintain their appearance, ensure safety and for regulatory compliance.

Interestingly, aircraft manufacturers recommend washing an aircraft every 60 to 90 days. However, on average, commercial aircraft may benefit from being washed once a month, says Trøen. He further clarifies that this may vary. "Some operators opt for more frequent washes to ensure optimal performance and appearance," Trøen adds.

The frequency of cleaning greatly depends on the geographical location, where the aircraft is based. "The periodicity depends on the exterior environment of the aircraft," says Dr Khanna, who goes on to elaborate his point with an example. "In India and the GCC region, planes are usually cleaned once every 10-15 days. Then again, depending on the availability of the facilities, the frequency of cleaning may vary. With the mechanised cleaning solution that we provide, we recommend one clean every 20 days in the Indian subcontinent," he adds.

Apart from the fact that washing makes an aircraft look sparkly clean with the prominent display of the airline's logo enhancing the overall look of the aircraft, its basic advantage is to extend the life of the aircraft paint and to help in the early detection of smaller cracks and other issues. We can safely say that it is an important maintenance activity that needs to be performed correctly as per certain guidelines and rules. These rules are published in the Aircraft Maintenance Manual (AMM), Structure Repair Manual (SRM) and Tool and Equipment Manual (TEM).



Traditional aircraft cleaning © *Shutterstock*

The process of washing an aircraft involves a series of steps to address not only aesthetic concerns but also critical performance and safety factors. Trøen throws light on specific areas that need extra attention: "Areas prone to contamination, such as the leading edges of wings and tail surfaces." Trøen adds that, "The entire process follows manufacturer recommendations, airline policies, and industry best practices to ensure that cleaning agents and methods do not damage sensitive aircraft surfaces or compromise safety. Also, every effort is done to reduce the environmental impact of cleaning agents."

Changing trends in aircraft washing – 'then and now'

Traditionally, aircraft are cleaned by using highly pressurised water and soap. There are predominantly two ways of cleaning an aircraft exterior surface, a wet wash and a dry wash. A wet wash uses high-pressure water in combination with alkaline emulsions, like soap. A typical A380 might use approximately 11,300 litres of water and over 9,500 litres of water is used to clean a Boeing 777. A dry wash is traditionally done by dry mopping or wiping down the complete fuselage with clean, dry cloths. This technique can be performed in any location. During a typical wet washing procedure, the engines are plugged to prevent accidental damage.

Interestingly airlines like Emirates and Cathay Pacific have been using the dry wash technique for quite some time as a more sustainable initiative.

Emirates use a liquid cleaning product that is applied manually to the entire external surface of the aircraft. Then the entire surface of the aircraft is wiped clean using a microfibre fabric to remove the cleaning product which has dried to a film, removing the dirt along with it and leaving the aircraft clean and polished. The aircraft is left with a fine protective film allowing the painted surface to retain its glossy and shiny appearance. It takes 15 staff Emirates about 12 hours to clean an A380 and about 9 hours to clean a Boeing 777 aircraft. With this technology Emirates has

> "The periodicity depends on the exterior environment of the aircraft."
>
> *Dr Ashwani Khanna, Executive Director, AeroTech Support Services*

> **Old technique requires the aircraft to be on the ground for several hours when it should have been up in the air making money for the airline.**
>
> *Ove Trøen, CEO Avinxt*

ended up saving 11 million litres of water every year.

Additionally, Emirates also claims that this waterless aircraft washing technique ensures that the aircraft remains cleaner for a longer period of time, reducing the number of washes to about three a year.

Since 2019, Cathay Pacific also partnered with HAECO for dry washing. Since then, the technique has saved the airline up to 860,000 litres of water in one year, plus HAECO uses non-toxic detergents that are biodegradable, adding to the airline's sustainability credentials.

Both the above methods have their own shortcomings. A wet wash proves to be of little or no use in removing corrosion and oxide films, while a dry wash is not suitable for removing heavy deposits of carbon, grease, or oil, especially in the engine exhaust areas.

To overcome these and many more shortcomings, like saving precious man-hours, newer, automated and more efficient aircraft washing technology has evolved over the years and been rapidly adopted by multiple airlines across the globe.

There is a gradual shift towards automation in all industries, including aviation services such as cleaning, de-icing and technical inspections. It may be hard to believe, but today most aircraft are manually cleaned, which is not only time consuming as it can take up to 150 man hours, but it is also very labour intensive. Expressing his frustration over such age-old techniques, Treon says, "Additionally the old technique requires the aircraft to be on the ground for several hours when it should have been up in the air making money for the airline." As a solution, Treon adds, "With our automated service, this old-fashioned, expensive and pollutive way of cleaning aircraft will be a thing of the past."

Elaborating on the automated process, Treon goes on to explain how this technology at Avinxt actually works. "Our service is fully automated, and the washing takes approximately 30 minutes. We use collected and recycled rainwater, which reduces the environmental impact. The limited need for manual labour and the reduced on-ground time for the aircraft, allow for increased washing frequency and lower cost."

The Avinxt washing technique uses a brushless solution that boasts of increasing the longevity of the aircraft exterior as it is gentler on the fuselage. The system also includes a recycling facility, which enables the Avinxt team to reuse the wastewater and fluids used.

Nordic Dino WXB Robot cleaning a widebody.
© Nordic Dino Robots

Nordic Dino Robot aircraft wash © *Nordic Dino Robots*

Avinxt also uses Pure Water, a specially treated and highly effective substitute to harmful chemicals traditionally used in aircraft washing, contributing to a more sustainable and eco-friendly operation.

"For airlines, ground operators and airports, this means less local ground pollution and of course, the clean aircraft will use less fuel, consequently reducing emissions by up to 2%," Treon proudly comments.

As aircraft washing technology has become more innovative and sophisticated over the years, not only the cleaning practices, but also attitude toward the working environment have changed significantly, explains Andrianovaite. She further elaborates by explaining how Nordic Dino helps to maintain a safe working environment. "Cleaning the highest surfaces of a large aircraft requires personnel to use specialized equipment and sometimes even climb onto elevated platforms. This exposes them to the danger of falls and injury, as even a minor misstep or equipment malfunction can lead to serious accidents. Aircraft-cleaning robots are equipped with advanced technology that enables them to safely operate at elevated positions, eliminating the need for human workers to engage in such risky activities. Instead of having individuals scale heights, operators can control these robots remotely from a safe and stable location on the ground. This innovation not only ensures the safety of workers but also enhances the overall efficiency and effectiveness of the aircraft cleaning process."

"Nordic Dino's advanced, computerized, and self-contained systems ensure safe and efficient exterior

aircraft cleaning processes that help reduce costs by optimizing fuel consumption, automating

operations, and reducing environmental impact through smart resource usage," Andrianovaite adds.

Attributing this changing trend in aircraft washing technology towards a more scientific approach, Dr Khanna says, "There is more science coming to the aircraft cleaning process, from the use of more smart washing solutions, to enhanced tools and now mechanisation of the entire process. Apart from that, the wet wash is changing to a dry wash."

He also pinpointed the use of special coatings on the exterior of the aircraft along with some enhanced paints also known as 'dust-proof paints' now available in the market that reduce dust accumulation on an aircraft.

Latest trends in aircraft washing

Speaking about the latest in aircraft washing technology, Adrianovite points to the cleaning robots that represent a cutting-edge solution with transformative potential in the aviation industry's quest for sustainability. She further reiterates how Nordic Dino robots, equipped with innovative technology, have emerged as a game-changer in the pursuit of cleaner aircraft exteriors. "They signify a departure from traditional manual cleaning methods and introduce automation into the maintenance process, offering a more efficient and environmentally friendly approach."

Interestingly the use of robotics, AI and automation has reduced the level of human intervention in the aircraft cleaning process, thereby resulting in faster turn-around times (TATs) and less scope for error. Elaborating on this, Adrianovite says, "Even though self-driving and fully autonomous washing solutions are in the future, Nordic Dino robots allow one to witness less human intervention in aircraft exterior cleaning processes. The robots are operated by one person, who controls

> ***"There is more science coming to the aircraft cleaning process."***
>
> *Dr Ashwani Khanna, Executive Director, AeroTech Support Services*

the cutting-edge machinery by wireless remote control."

Agreeing with Adtianovite, Treon says that the advancement of robotics and AI will reduce the need for human intervention and manual labour. "However, aviation is an industry with safety at the core of everything we do, so there will always be a human component involved," Treon adds.

As far as human intervention is concerned, aircraft cleaning will always require human input, emphasises Dr Khanna. "Critical areas like the areas near the landing gear, flaps and slats, pitot tube and stall horn and certain critical antennae require human intervention." He goes on to add that in the future, basic manual work will be taken over by robots, but critical work areas will still be handled by experienced human beings.

Further emphasising the role of the latest technology, Adrianovite adds that the technology not only contributes to airlines' ESG goals and maintains a safe working environment, but it also protects the aircraft from any damage. "One of the safety features is the use of sensors that detect the proximity of the aircraft and adjust the cleaning process accordingly in order to avoid damage," she concludes.

The robots come in different shapes and sizes depending on the size of the aircraft. For example, the Nordic Dino XB is specially designed for wide-body aircraft. It comes with a washing height of 11 meters, and this three-armed system can ideally handle cleaning the top of an A330 or B777.

Interestingly, the robots can perform up to 450 washes annually and reduces the time factor by 91 man hours per wash on an A380.

Nordic Dino XB Robot © *Nordic Dino Robots*

Avinxt robots are a custom-designed washing tool and they come with interchangeable tools, specifically designed for aircraft cleaning. These tools are equipped to deliver the correct pressure and amount of water, ensuring precise and efficient cleaning. With a coverage area of 320cm in length, the automated aircraft wash system boasts of completing the task faster and more efficiently than traditional methods.

Speaking about AeroWash, Dr Khanna explains that the AeroWash's 'exterior mechanised dry wash' is the only one in the world as of now. He emphasises some of its unique features like special programming helping the operator to perform the washing task with ease, compatibility – as it is compatible with both wide- and narrow-body aircraft, and it has multiple layers of safety reducing any possible damage to the aircraft.

Air India recently adopted this one-of-a-kind technology and ended up saving about 75,000 litres of water per wide-body and 30,000 litres per narrow-body per year. Prior to Air India, Vistara had also incorporated the AeroWash washing system to wash its planes.

Conclusion

As newer technologies emerge each year, there will be tough competition between different companies depending on the unique technology they offer, the level of cost-effectiveness for an airline, the number of hours an aircraft remains AOG, and its sustainability factor.

Avinxt has explained about its sustainability and cost-effectiveness by providing an interesting analysis. Burning one gallon of jet fuel releases approximately 22.4 pounds of CO2. If an aircraft's fuel consumption is reduced by just 1% it would lead to a reduction of approximately 1,612 metric tons of CO2 emissions per year.

Aircraft mechanic tool box
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Never Lose a Tool - The Crucial Importance of Aircraft Mechanic Tool Control

Implementing Strict Aircraft Mechanic Tool Control Procedures

By AIda – carefully edited by our editors

The crash of Air France Flight 4590, a Concorde aircraft, in Paris on July 25, 2000, remains one of the most tragic and well-known incidents in aviation history. The crash was attributed to a small piece of debris on the runway, which led to a catastrophic chain of events resulting in the loss of all 109 people on board and four individuals on the ground.

While the Concorde crash in Paris in 2000 was not related to lost tools, it underscored the critical importance of maintaining a clean and safe working environment in aviation maintenance. The incident demonstrated that even seemingly minor debris on the runway or near an aircraft can have catastrophic consequences. This could be a tool.

Aircraft maintenance is a precise and highly regulated field where attention to detail is paramount. The tools used by aircraft mechanics play a crucial role in ensuring the safety and airworthiness of aircraft. To maintain control and accountability over these essential tools, aviation maintenance facilities must implement strict tool control procedures. While Maintenance, Repair, and Overhaul (MRO) software solutions like TRAX and AMOS provide valuable technical support for tool control and maintenance operations, the effectiveness of any tool control system ultimately relies on well-defined and rigorously followed procedures to prevent human errors. We look into how to establish and enforce effective tool control procedures to enhance safety, efficiency, and compliance in the aviation industry.

Develop a Comprehensive Tool Inventory

The first step in implementing strict tool control procedures is to create a comprehensive inventory of all tools and equipment used in aircraft maintenance. This inventory should include details such as tool names, serial numbers, calibration dates, and assigned personnel.

Assign Responsibility

Clearly define roles and responsibilities within the organization for tool control. Designate individuals or teams responsible for maintaining, tracking, and documenting the tools. This ensures that accountability is established from the outset.

“ The tools used by aircraft mechanics play a crucial role in ensuring the safety and airworthiness of aircraft. ”

> "Regularly conduct tool audits to verify that the inventory matches the records."

Tool calibration

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Tool Marking and Identification

Each tool should be clearly marked and labeled with unique identifiers, such as serial numbers or barcodes. This makes it easier to track and identify tools during inspections and audits.

Implement Tool Control Cabinets

Invest in secure tool control cabinets or chests where tools can be stored when not in use. These cabinets should be locked and accessible only to authorized personnel. Access control measures, such as key issuance or electronic locks, can enhance security.

Tool Check-In and Check-Out Procedures

Develop standardized procedures for checking tools in and out. Mechanic technicians should sign tools in and out, providing details like their name, the tool's serial number, and the date and time of the transaction. This creates a paper trail for accountability.

Regular Tool Inspections

Conduct regular tool inspections to ensure that all tools are accounted for and in good condition. This can be done daily, before and after maintenance tasks, and during scheduled inventory checks.

Tool Control Training

Provide comprehensive training to all personnel involved in tool control. Training should cover proper tool handling, storage, and the importance of tool control procedures. Technicians should be aware of the consequences of tool mismanagement, including FOD (Foreign Object Debris) risks.

FOD Prevention

Emphasize the critical role of tool control in FOD prevention. Unaccounted-for tools left on or near aircraft can pose serious safety hazards. Educate all personnel on the importance of keeping the work area clean and ensuring that all tools are properly stored after use.

Recordkeeping

Maintain detailed records of tool transactions, including check-ins, check-outs, repairs, and calibration. These records should be readily accessible for audits and compliance checks.

Audits and Accountability

Regularly conduct tool audits to verify that the inventory matches the records. Hold individuals accountable for any discrepancies or lost tools. Implement a system of consequences for repeated violations to reinforce the importance of tool control.

Implementing strict aircraft mechanic tool control procedures is essential for maintaining safety, efficiency, and compliance in the aviation industry. By developing a comprehensive tool inventory, assigning responsibility, and enforcing check-in and check-out procedures, organizations can reduce

the risk of FOD incidents, ensure tools are properly maintained, and enhance overall operational excellence. Strict tool control is not only a regulatory requirement but also a fundamental practice that contributes to the reliability and airworthiness of aircraft.

If something went wrong – take action

If a tool is unaccounted for outside of the designated storage area, it becomes imperative to initiate a detailed search and investigation to ensure that it has not been inadvertently left on or inside an aircraft. The potential consequences of a lost tool on an aircraft are significant, including safety risks, potential damage to the aircraft, and operational disruptions. Here are steps to take in such a situation:

Immediate Action

As soon as it's discovered that a tool is missing, inform the maintenance team and relevant personnel immediately. Time is of the essence in such cases.

Identify the Last Known Location

Determine where the tool was last used or checked out. Interview the personnel who were responsible for the tool at that time to gather information.

Conduct a Thorough Search

Mobilize a team to conduct a systematic search of the aircraft where the tool was last used or in any other areas where it may have been inadvertently left. Check all compartments, access panels, and storage areas.

Review Documentation

Review all tool check-out and check-in records to ensure that there are no discrepancies or inaccuracies in the tool's movement history.

Notify Relevant Authorities

If the tool cannot be located within the aircraft, notify relevant aviation authorities and airport personnel of the situation to ensure that appropriate safety measures are taken.

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Implement Preventive Measures

While searching for the tool, take steps to prevent further aircraft movement or maintenance tasks that may inadvertently cause additional issues or complications.

Investigation and Reporting

Conduct a thorough investigation into how and why the tool went missing. Determine whether any deviations from established procedures occurred and address them accordingly. Maintain detailed records of the investigation.

Safety Assessment

Assess the potential impact of the missing tool on the aircraft's safety and airworthiness. Depending on the tool and the specific aircraft systems it could affect, this assessment may vary in complexity.

Corrective Actions

Based on the investigation's findings, implement corrective actions to prevent similar incidents in the future. This may include adjustments to tool control procedures, additional training, or changes to the tool storage and handling process.

Documentation and Reporting

Maintain thorough documentation of the entire incident, investigation, and corrective actions taken. Report the incident to relevant aviation authorities and regulatory bodies as required.

Communication

Keep open and transparent communication with all stakeholders, including the airline, maintenance team, airport authorities, and regulatory agencies, to ensure a coordinated response.

The goal in such situations is not only to locate the missing tool but also to understand how the incident occurred and implement measures to prevent its recurrence. Safety and thorough investigation are paramount in the aviation industry, and every effort should be made to mitigate risks and maintain the integrity of aircraft maintenance operations.

About this article

Rapid technological developments are changing our work environment. We at AviTrader also do not want to ignore these developments and trends. Therefore, we have decided to launch AIda, an AI based article writer. However, AIda's drafts are thoroughly fact-checked by our editors.

on the move


Erlendur Svavarsson

AJW Capital, a key player in aviation asset management, part of the AJW Group, has announced the appointment of **Erlendur Svavarsson** as its Chief Executive Officer (CEO). Svavarsson brings a wealth of experience to the role, having served as an accomplished CEO and Board of Directors member within the airline and aviation industry with roles previously held at Cabo Verde Airlines, Loftleidir Icelandic, Arctica Finance and Faradair Aerospace. With a proven track record in leadership, business development, strategic planning, organisational change, international business, negotiations and mergers and acquisitions, Svavarsson is a highly skilled professional. He is a graduate of the University of Iceland and holds an MBA, summa cum laude, from Reykjavik University, as well as completing studies at the prestigious Harvard Business School. In his new role at AJW Capital, Svavarsson will spearhead the company's strategic initiatives as it continues to thrive within the aviation industry. As part of the AJW Group of companies, AJW Capital serves as the principal investing division responsible for the purchase, sale, and lease of large aviation-related capital assets, including whole aircraft and engines.


Gary Pratt

STS Aviation Group (STS) has appointed **Gary Pratt** as the new Senior Vice President and General Manager of STS Line Maintenance. With an illustrious career and a wealth of experience in aviation maintenance, Pratt is set to steer the company towards unprecedented growth and innovation. As Sr. VP and General Manager, Pratt will oversee operations for 43 Line Maintenance stations across the United States, ensuring each maintains the highest standards of quality and safety that STS Aviation Group is known for. His leadership will be instrumental in enhancing operational efficiency, expanding service capabilities and driving customer satisfaction to new heights. Pratt expressed his enthusiasm about the new role, stating, "I am honoured and excited to lead STS Line Maintenance into its next chapter. The opportunity to work with such a talented team and to build upon the company's sterling reputation is truly invigorating. Together, we will continue to innovate and elevate our service offerings, ensuring that STS remains at the forefront of the aviation maintenance industry." Under Pratt's leadership, STS Line Maintenance is poised for a new era of growth and success. His strategic foresight and unwavering commitment to quality are expected to usher in a wave of advancements in line maintenance services, ensuring that STS Aviation Group continues to exceed the expectations of its customers.


Yuana (Yung Eun) Sung

Novus Aviation Capital (Novus) has reported the promotion of **Yuana (Yung Eun) Sung** to Executive Vice President (EVP). With a nine-year tenure at Novus, starting as Vice President, Sung has been integral in expanding the company's operations across Asia. Her expertise in successfully concluding various aircraft sales, leasebacks and financing lease transactions with Asian partners has been invaluable to the company's growth. **George (Young Ho) Ai**, Head of Asia and Global Equity praises Sung, stating "Yuana's in-depth industry knowledge and exceptional ability to navigate challenging transactions have consistently set her apart. As she continues to lead our Korea operations, we are also looking forward to her valuable contributions to the broader Asia Commercial Team." Novus Aviation Capital is an independent platform established in 1994 with a successful reputation and track record in providing innovative and creative solutions in the trading, leasing, financing, management and re-marketing of commercial jet aircraft. The company operates globally out of four offices in Europe, Asia and the Middle East. Its global presence and continued success is dependent on the excellent client relations that have been established with investors, lenders, airlines and other stakeholders over the years. Novus Aviation Capital offers the full spectrum of dedicated aviation expertise to support its transactions, including the resolution of distressed situations, should they arise, with timeliness and professionalism. The company's ability to evolve and adapt to changing market dynamics has demonstrated its resilience and commitment to the industry, whilst its financial independence allows for more flexibility, bespoke services and speedier turnaround.


Mark Moffat

IFS, the global cloud enterprise software company, has promoted **Mark Moffat** to Chief Executive Officer (CEO). Moffat takes over from **Darren Roos** who has been appointed as the company's Chair of the Board. Both appointments are effective immediately. The transition provides great continuity for the business by building on the successful strategy that has seen IFS transform into the leading vendor for Asset & Service Management software. Moffat, Roos and the IFS Executive Team have been working on the transition over the past six months as part of the Board's succession planning process. Moffat, who was previously IFS Chief Customer Officer, is a well-known and respected technology leader having held several senior positions at PwC before joining IFS.