

free

MRO ASIA-PACIFIC 2020 SUPPLEMENT

www.Key.Aero

Airliner

World

the global airline scene

MAINTAINING THE EDGE

A large jet engine is shown from a top-down perspective, mounted on a maintenance stand. The engine's fan blades are visible, and the surrounding structure is white and yellow. The engine is the central focus of the cover image.

Interior focus

The importance of a slick cabin

Component overhaul

Inside the re-generation game

Maintenance software

Calculating the benefits

Airframe maintenance

Is now the time to invest?



The Inside Job

Dirty, scuffed cabins can affect an airline's reputation, so ensuring aircraft interiors and their associated systems are well maintained is vital



It's been expressed by some airline management that aircraft lavatories characterise the condition of the rest of the cabin.
FLICKR COMMONS/
DOUG LETTERMAN

Marko Männiste, managing director at MAC Aero Interiors (a subsidiary of Estonia-based Magnetic MRO), reported that: "Most of the attention and effort for both production and maintenance are paid on parts that are exposed to passengers directly, like seats and all associated parts."

"In addition, some airlines underline that lavatories define the condition of the whole cabin, therefore the high standard during lavatory upgrade programmes is always the key for the MAC team. We put [in] great effort to support our customers with solutions to modify [and] refurbish lavatories, as we have extensive experience and knowhow on this. [In the] meantime, the various monument wear and tear issues are resolved by bringing on board innovative ideas and solutions, like replacing outdated class dividers with glass versions," he added.

Nina Schulz, head of product sales and key account management EMEA, base maintenance services at Lufthansa Technik (LHT), also identified key areas that need to be monitored for problems. "In general, structural attachment elements connecting interior components between floor structures, such as seat tracks, floor beams and intercostal beams, monuments,

partitions, galleys, seats and lavatories are affected by various kinds of corrosion. This is especially true in wet areas in the entrance of an aircraft, and all galleys tend to show severe corrosion on aluminium structures still widely used on commercial aircraft," she stated.

"The main reason for corrosion is generally moisture ingress between floor covering and underlying structures. Spilled juices, acid rain in combination with temperature changes and friction in between the connections causes such corrosion," Schulz continued.

"Also the common time-saving practice during smaller maintenance events – to avoid monument removal for exchange and renewal of non-textile floor [NTF] covering changes – floor covering are cut around the monuments or inside lavatories resulting in cuts to the aluminium surfaces – [and these] are the major root cause for [severe corrosion to] fittings and intercostal beams and fittings connecting the monuments with the floor structures. Water and spilled liquids pass through cuts and poorly sealed splices, while capillary force spreads the liquids under and in between the cavities of the attachments," she added. >>



Above right • Wet areas of the aircraft cabin generally exhibit severe corrosion on aluminium structures.
LUFTHANSA TECHNIK

After the frontline personnel, such as crew and check-in agents, the aircraft cabin is the key visual and physical benchmark of an airline's brand. No matter how cleverly designed the cabin is, if it's not well maintained, passengers notice and form opinions.

Of course, some parts of the interior – such as galleys, lavatories, monuments, seats and lights – experience much greater levels of wear and tear than others and therefore tend to require increased amounts of maintenance.

The state of an airline's cabin can severely affect the reputation of that carrier.
FLICKR COMMONS/
PHILLIP CAPPER



Above those attachments are the seats themselves. Neil Cairns, CEO of Acro Aircraft Seating, has a simple assessment of the maintenance challenges of interiors and particularly his company's area of expertise. "In seating it's a straightforward equation: the more parts, the more maintenance," he declared.

"At Acro, we have long recognised that simplicity is the essence of good design and the key to robust, low-maintenance seating. The 'keep it simple' principle underpins everything we do, and is evident not only in the clean, contemporary lines of our products, but also in the cost and operational benefits to our airline and lessor customers," Cairns added. "Those benefits are becoming more important than ever as financially challenged airlines address the post-COVID requirements for increased cabin sanitisation and the protection of 'personal space' for wary travellers.

"Achieving design simplicity is a complex business, demanding bold and creative thinking as well as consistent precision in manufacturing. We believe that just because something has always been done one way, doesn't mean that it can't be done differently and better, as demonstrated by our unique approach to recline design.

"One of the most common points of seating failure particularly in economy class, lies with the in-arm recline button. When the mechanism fails, passengers tend to complain long and loud, but there is no quick fix because the main drawback of the traditional in-arm recline button is its long and complicated cable run which inevitably requires the removal of a

A common problem with economy seating in the past has resulted when the in-arm recline button fails. Often a complicated fix, Acro Aircraft Seating have developed a solution where the issue can now be fixed within minutes
ACRO AIRCRAFT SEATING



number of components in order to access the cabling for repair.

"Acro took a fresh look at the problem and came up with a solution which now features across all our reclining seat ranges," Cairns reported. "By repositioning the recline lever to the front spar we made the recline easier for passengers to access, while also minimising maintenance issues. The seats now have an exceptionally short cable run with minimum bend so that the recline mechanism and associated cabling can be accessed easily under the composite foam seat pan cushion and can therefore be fixed 'on-wing' within minutes. As an added benefit, because armrests are no longer required to support a recline mechanism and

associated cable routing, they can be removed and replaced in a matter of seconds should the need arise."

Cairns also pointed to the seat cover as another area which suffers a lot of abuse and impact. "Acro seats are designed to use a minimal amount of Velcro and combined with an integrated easy-fit system so that the backrest cover can be removed and refitted without the need to remove the entire backrest shroud," he observed. "Foam lamination is integrated within the cover to avoid two-part covers and additional stock holding for airlines. Again, this allows [operators] to perform quick maintenance and repairs within minutes 'on-wing'."

Minimising the part count across the Acro range has enabled the company to maximise robustness and means that, should a part break, it can be replaced



in minutes. "Our Series 3 product platform, with just 63 parts per triple, is a great example of this ethos in action, delivering superb financial benefits to hardworking fleets of low-cost carriers. We've also strengthened our aftermarket capability with Part 145 maintenance organisation approvals accreditation which enables the company to perform maintenance, repair and modification services both on and off wing," Cairns remarked.

Within the cabin, quite a few fittings are deemed non-critical for operation, so for part replacement when visual damage is substantial, consideration is being given to the use of 3D printing for such items.

"Acro routinely uses 3D printed parts for prototyping and is currently harnessing its benefits as to explore issues such as divider screens and centre-seat blocking," said Cairns.

High footfall areas such as galleys and aisles need to be particularly resistant to continuous wear and tear
ACRO AIRCRAFT SEATING

Durable and reliable aircraft seating is essential to ensure flight schedules are met
AIR FRANCE





“The company is actively exploring the potential benefits of expanding the range of uses for this technology, notably in facilitating cost-effective customisations for optimum airline branding, and working towards a future in which 3D printed parts will help the continuous quest to reduce part counts as well as seat and cabin weight.”

There is similar enthusiasm at MAC Aero Interiors, according to Männiste. “We are very keen on the additive manufacturing process; thus, 3D

printing is something all operators should consider as it keeps the costs and the lead time down,” he argued. “We have currently near to 50 different interior parts that can be printed, some of them make a great impact on the overall aircraft weight as using 3D printing, we can bring unit weight down by up to 40%. Currently we have worked out solutions for tray tables, bezels, arm caps, decorative panels and so on, and have plans to increase our 3D printed elements portfolio even further.”

Within the MRO sector, 3D printing has been acknowledged to have kept costs down
MAGNETIC MRO

Low-cost carriers, such as Cebu Pacific, utilise a dense single-class cabin configuration to leverage operating efficiencies.
FLICKR COMMONS/ALAN WILSON

The value of 3D printing is also appreciated at Lufthansa Technik. “As most of the items are less critical for daily operation, the cost of changing major attachments can impact the costs of a layover dramatically,” Schulz observed.

But she cautioned that while 3D printing has become an alternative for the production of complex shaped structural elements, like certain cabin fittings, it may not be the solution yet.

“Even though the strength of suitable materials allows the use of 3D printed parts, the PMA process is often a bottleneck when trying to get the required drawings and load calculations in order to remanufacture a corroded part. The intellectual property rights of the OEM [original equipment manufacturer] are often the [blockage] even when 3D printing for such materials may offer a fast fix for a new part. In short, many parts could be printed at an MRO facility owning a 3D printing unit, but legal aspects and permissions to remanufacture parts often eliminate the cost-saving factor,” Schulz commented.

With 2020 having changed so much in the industry, airlines have been assessing how they deal with individual





Lufthansa Technik is an active participant of the Independent Aircraft Modifier Alliance (IAMA), which develop a certain set of standards for the industry
LUFTHANSA TECHNIK

the most requested modifications since COVID-19 struck," she added. "Lufthansa Technik is currently bringing a number of ideas to the market, including cabin sanitation products to support our customers in bringing back passengers into their aircraft."

According to Cairns, the established Acro strapline 'discover freedom to move' characterises a "longstanding commitment to providing ergonomic comfort and a feeling of space", not least within higher density economy class cabins. "This is particularly relevant to the Asia-Pacific [region] with its predominance of LCCs [low-cost carriers]," he emphasised.

"At a time when passengers want to see and experience improved social distancing, innovative designs and the opportunities surrounding the new customisable 'staggered seating' configurations, which were soft-launched pre-pandemic, are ideally suited to helping restore passenger confidence. Not surprisingly, we are already at an advanced stage of work with [several] airlines refining those advantages to meet the new demands of the post-COVID-19 market. Our creative collaborations are particularly prevalent in the Asia-Pacific [region] where major airlines are renowned for driving cabin innovation and highly customised seating solutions," he added.

Chinese-owned Acro has ambitious growth plans in place for its UK >>

spacing for passengers because of the COVID-19 outbreak, which could even lead to seat or layout modifications.

"We are currently focusing on modifications, for example, of seats and disinfection equipment to be used on aircraft in order to regain confidence for our customers' passengers," Schulz acknowledged, while remaining sceptical. "The space in any aircraft is very limited and reducing seat capacities to get distance rules applied

in an aircraft are not an option due to the required load factors needed for profitable operation.

"We just saw a wave of high-density modifications on low-cost airlines, while now things are going in the opposite direction. Many operators may elect to wait for a vaccination against COVID-19 before starting to remove seats to re-pitch the layout. Cargo operations for medical essentials transported on passenger seats were

Some issues arise with the use of 3D printing. For example, many parts may not be quickly reproduced, even if a 3D printer is available, due to the intellectual property rights of the original equipment manufacturer
MAGNETIC MRO

