

Aircraft

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CABIN

Perfecting the passenger experience

Management



CHAIN REACTION

How To Build Back Better

IN THE COMFORT ZONE

How can airlines ensure the wellbeing of their passengers?

ONBOARD ENTERTAINMENT

Post-pandemic expectations are forcing the industry to think again

SATCOM CONNECTIVITY

How are satcom service providers plotting their technology roadmaps?



Shaping the Future of Inflight Connectivity

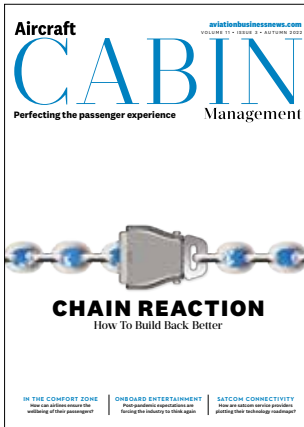
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Editor's Letter

CHAIN OF COMMAND

The aerospace supply chain has been sluggish in bouncing back from the protracted effects of the Covid-induced slowdown. And this at a time when Boeing and Airbus are planning an aggressive ramp up of production in their narrowbody programmes and when the capacity to service the cabin interiors aftermarket is fast reaching its near-term limit. Many are asking whether the industry will be able to handle a full aviation recovery in 2023 with workforce numbers and resources that still languish at peak-Covid levels.

Aviation supply chains are notoriously complex and consist of many different types of suppliers, manufacturers and maintenance providers. No doubt, tight labour markets and limited component availability will spur further consolidation in the sector and accelerate efforts by the largest manufacturers to bring more of their supply chains in-house.

One particular problem that arises from the industry's complexity is a lack of visibility in the processes of the supply chain. When one link in the chain falters, a dangerous domino effect can soon propagate through the whole of the chain. Better visibility throughout the supply chain can therefore allow manufacturers to react quickly when one node weakens and limit any collateral damage.

Indeed, businesses are fast learning how to model the impact of specific parts,



operational or personnel shortages before they occur. Advanced tools such as those developed by Aerogility that employ artificial intelligence are coming into their own as a way of modelling and simulating many potential scenarios, including anticipating delays before they occur. Whichever tools are chosen, manufacturers need to prepare for and apply strategies to mitigate against planned and unexpected disruption – or expect to face an existential threat.

The pandemic fallout has caused significant issues for the aircraft cabin interiors segment but our cover story demonstrates that, while the supply chain situation remains challenging, having the right procedures, communication channels and creative thinking in place can allow any size of business to continue to produce pioneering products to the very highest standards of design and build quality.

Aimée Turner

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BUSINESS BRIEFING



AIRCRAFT

Airbus stretches A350 interior with ultra-narrow, 10-abreast economy seating

➤ Airbus has sculpted the interior cabin walls of the A350 to create 10-abreast economy seating which could add up to 30 seats, allowing the -1000 variant aircraft to carry significantly more than 400 passengers in certain configurations.

Airbus chief commercial officer Christian Scherer said the new 3-4-3 seat configuration standard would be achieved 'without compromising seat width', through 'pushing out' the walls to provide additional interior width. Both the aircraft frames and how they attach together have been adapted which means the interior of the cabin fits two inches closer to each side of the aircraft's fuselage.

In addition, the cabin will be 35 inches longer through slightly pushing the front wall forwards and the rear bulkhead backwards by almost a frame through

changes to the flight deck layout and a more efficient use of galley architecture in the bulkhead structure.

The typical A350-1000 accommodation is pegged at 369 seats in a two-class layout, with 54 business seats and 315 nine-abreast economy seats in a 3-3-3 configuration. The denser cabin option would also see the aircraft rival the Boeing 777-9, which has a two-class layout of 414 seats – comprising 42 in business and 372 in a 10-abreast economy configuration.

Scherer said the superior comfort standards of the A350 including cabin altitude, air quality and sound levels means the densification of the aircraft, which secures an extra seat in every economy row, will not impact current passenger comfort levels.

The thinner and new contoured side walls will offer four inches more space at

armrest level and the increased width will allow Airbus to offer ultra-narrow 17 inch-wide seats with a 1.5 inch armrest width.

The New Production Standard 2022 A350 also offers a significant weight reduction of up to 1.2t and a 3t maximum takeoff weight increase allowing the aircraft to maintain its maximum range beyond 8,000 nautical miles/14,816 km.

Airbus said the first New Production Standard 2022 aircraft with the wider cabin was delivered to Spanish airline Iberia on 29 September, although none of the first deliveries of the new standard are 10-abreast – all are nine-abreast.



369

The typical accommodation of a A350-1000 is pegged at 369 seats in a two-class layout



AIRLINES

Virgin Atlantic reveals premium A330neo cabin



Virgin Atlantic's Airbus A330neo customer experience has made its debut with an Upper Class cabin that features new seating, an evolution of its social space and an exclusive suite system.

Both Premium and Upper Class will be equipped with in-seat wireless charging with additional USB connections, Bluetooth-enabled entertainment systems available throughout the aircraft.

Fast in-flight internet connections are made possible by connecting passenger devices directly to Viasat's managed network of Ka-band satellites with onboard equipment designed to be

forward-compatible with the ViaSat-3 satellite constellation.

The airline's Retreat Suite consists of two exclusive suites at the front of the cabin comprising a 6ft 7in direct seat to fully flat bed and a 27in touchscreen with Bluetooth connectivity and wireless charging. Each suite allows up to four people to have their own private space. Thirty fully forward-facing Upper Class suites offer more space and storage alongside a 17.3in touchscreen TV and fully closing privacy door. Virgin Atlantic will take delivery of three aircraft in 2022. The next 16 aircraft will enter service before 2027.

SEATING

Air New Zealand's 787 business cabin boosts available space



Air New Zealand has unveiled its brand-new cabin interior featuring its latest Business Premier seats, designed and manufactured with Safran Seats.

Due to enter into service in 2024 to be retrofit on the airline's current Boeing 787-9 fleet, the seat was specifically designed for the aircraft type to maximise available space.

The two seating options within the business premier cabin include the Business Premier which offers a private 'nest' where those travelling in the middle row can open their space to others, while the Business Premier Luxe offers a fully closing door and space for two people to dine.

Air New Zealand's Kerry Reeves said the airline encouraged Safran to think differently. "Working virtually throughout Covid added another layer of complexity," he explained. "Without being able to travel to the Safran site to validate our ideas and concepts, we paralleled the mock-up build both in New Zealand at our innovation lab and at Safran to ensure we had a common design interpretation and valid feedback on the engineering development of the layout and features."

BRIEFS



British satellite business OneWeb is in talks to merge with the French Eutelsat in a bid to create a global multi orbit satellite services provider that could see Eutelsat's 36-strong fleet of GEO satellites combine with OneWeb's eventual constellation of 648 Low Earth Orbit satellites. The partners said the transaction builds on their deepening collaboration begun with the 23% equity stake acquired by Eutelsat in OneWeb last April and the global distribution agreement between Eutelsat and OneWeb announced in March.

Thompson Aero Seating is reporting an upsurge in interest regarding new twin-aisle projects for platforms such as the Airbus A330 and Boeing B787 in readiness for an anticipated 2024 recovery. Thompson said its airline customers are looking at the refreshed VantageXL with its enhanced fully flat horizontal bed and 100 per cent direct-aisle access and enclosed suite and Business Plus options. The manufacturer is warning however that airlines need to start soon in order to have the capacity available for 2024.

Emirates' new fleet of Airbus A350-900s will be equipped with Thales' Avant Up inflight entertainment solution. Emirates' entertainment content on more than 5,000 channels will be delivered on Optiq, Thales' 4k QLED HDR display, which is the first to offer two Bluetooth connections and built-in Wi-Fi for passengers to pair multiple devices, while supporting up to 70 watts of in-screen charging. The airline will start taking delivery of the 50 aircraft in 2024.

TRIPLE WIN

Harmonised inflight connectivity offers a triple win for airlines, mobile network operators and customers.

David Fox, vice president, inflight & connectivity services at Deutsche Telekom Global Carrier, outlines the benefits of unified onboard connectivity and his company's unique ONE Connectivity solution



— **“At Deutsche Telekom Global Carrier, we aggregate an airline's various Wi-Fi connectivity providers into one coherent and unique solution with our ONE Connectivity Experience”**



David Fox is vice president, inflight & connectivity services, Deutsche Telekom Global Carrier

Today, most of us take continual connectivity for granted. We find it normal to be online everywhere and any time. The only place those expectations fall short is when we're flying. Even if Wi-Fi is available, the log on and payment processes are often complicated. And yet, when airlines and mobile network operators (MNOs) collaborate, the solution can be simple.

Difficulties of IFC

Passengers rate inflight connectivity (IFC) based on simplicity and cost. Unfortunately, the prevailing multi-step process of online access is very challenging. With an average European flight of only 70 minutes, passengers may feel they're spending more time trying to connect than being online. That, combined with performance and cost concerns, have kept take-up rates far below their potential.

As a result, the value for passengers as well as airlines is not satisfactory. The latter have often substantially invested to make the service available, yet do not experience adequate ROI. The answer is to create a harmonised passenger experience for all their connected aircraft. MNOs also need to act, to make connectivity in the skies readily available to their subscribers.



A brief history of IFC

Over the past decade, a few companies started to work with IFC providers to offer 'Smart Client' smartphone software that automated the connection process. They also established roaming agreements through which charges could be applied to a passenger's home service provider, thus streamlining logging on.

This yielded a significantly improved user experience, but continues to be technically complex to implement and maintain. In parallel, MNOs and Hotspot 2.0 technology entered the field. However, there was still a large piece missing: the framework to support 'near-seamless' technology.

Deutsche Telekom Steps Up

A few years ago, Deutsche Telekom Global Carrier began including inflight connectivity as part of its product portfolio. Today, we offer our one-of-a-kind ONE Connectivity Wi-Fi platform which is operated over our in-cabin

Illustration: Phil Couzens



“More connected passengers promote the service to others, offering a larger footprint to sponsors and associates”

Wi-Fi Hub and several modules. Most airlines cooperate with a variety of MNOs and IFC providers, as well as satellite and/or air-to-ground solutions. That makes management and routing of traffic complicated.

With our solution, airlines can centrally control operations, promotions, campaigns and more – across entire fleets and no matter which providers they work with. We have already partnered with carriers such as Lufthansa and Cathay Pacific for this service, which is seamless and easy to use with tailored offerings.

With one-click log-on and ‘smart-pricing’ models, airlines are able to increase Wi-Fi purchases. We also offer voucher systems and APIs that allow passengers to purchase access before flying, and helps airlines run marketing campaigns.

Passenger and airline gains

The advantages to passengers of harmonised connectivity strategies, such as our ONE Connectivity Experience, are clear, making onboard Wi-Fi service easier to use and of better value than in the past. Passengers enjoy an

automated, near-seamless experience. They also gain more value from their mobile contract, including inflight connectivity without fear of bill shock.

Airlines are also big winners. More connected passengers promote the service to others and thus offer a larger footprint to sponsors and associates.

They also benefit from MNOs advertising bundled inflight connectivity, in which they name their partnered airlines. Plus, customers are more likely to travel with an airline where such service is available. In addition, connected passengers provide insights, enabling airlines to tailor their onboard services and expand auxiliary revenues.

And lastly, airlines become more flexible, as they can offer provider-agnostic solutions. The single-portal approach allows them to easily launch new features, harmonised over all their platforms, independent of the connectivity solution.

What’s in it for MNOs?

MNOs are also able to create additional value for their subscribers. That comes not through the resale of connectivity itself, but through the perceived value

that bundled inflight connectivity adds to an MNO’s overall service portfolio. It creates opportunities to up-sell as well as improve loyalty.

A happy customer is also more likely to recommend their MNO’s service offering. In the B2B context, delivering aggregated access to inflight internet can attract high-revenue accounts with many frequent fliers, such as multinational or consultancy firms.

Looking ahead

The technology to enable seamless or near-seamless access to inflight connectivity has been available for some time. However, it will only take off once MNOs truly begin to bundle access and communicate the advantages to a large subscriber base.

Offering simple, seamless log-on to subscribers dramatically improves passenger experience and generates significant value for both airlines and MNOs. At the same time, other service offerings such as inflight entertainment, onboard e-commerce and IoT solutions also contribute to the demand for more connectivity. These should be considered as the airline industry recovers from the challenges of the coronavirus pandemic. ●



Harmonised connectivity strategies make onboard Wi-Fi service easier to use and of better value

SIDE BY SIDE

Astronics prides itself on working with customers to solve complex challenges. **Aimée Turner** spoke to Dennis Markert, Cabin Electronics' director of business development within Astronics Advanced Electronic Systems on how a deep collaboration with both airline and business partners fulfils one essential goal: to delight the passenger

Aircraft Cabin Management: Astronics has secured a powerful 89 per cent share of the market. How can you explain Astronics' success in this market and how does it differentiate itself?

DM Astronics culture is one of customer centricity which means keeping a relationship with our customers and understanding their needs as well as the needs of their passengers. Drawing upon these relationships and understanding present and future commercial market trends, we've been able to develop innovative power solutions for any airline need.

Full-service airlines and low-cost carrier have vastly differing commercial and technical requirements. However, all require the most innovative, reliable, highest power, lightweight systems that ensure the best passenger experience in the industry.



Dennis Markert is director of business development, global sales & marketing



1

Our power systems are line fit offerable at all major aircraft OEMs and are uniquely scalable. This means we can provide systems that are seat centric, zonal, line fit and retrofit using much of the same highly reliable system components. Our systems are very attractive to the airlines as we have a vast array of commercial off the shelf (COTS) options for any installation scenario.

To date, we have more than 290 global airline customers and we provide systems for all customer types, standalone systems (in seat power only) and systems that are sold to major IFE suppliers who integrate them into the aircraft as part of their IFE system.

Coming out of a post-pandemic environment, how do you think Astronics' relationship with its airline customer and business partners has developed throughout the slowdown?

During the slowdown, Astronics continued to invest in R&D, which proved important because our customer's needs and priorities shifted during the slowdown. A focus on efficiency, less weight and overall sustainability emerged. Further, the adoption of USB-C in the commercial electronics environment has caused a quicker adoption by the airlines to incorporate USB Type C at a faster pace.

Our latest system, UltraLite GEN2, which was developed during this slowdown was able to nearly double the output power of our previous zonal system – which was industry-leading at the time – while reducing size and weight and providing up to 60W of power to each passenger.

One thing that has been unfortunate for the aerospace industry, among many other industries, is the recent global supply chain challenges. Astronics Cabin Electronics group has not been immune to this. The impact is still being felt today and, although there is improvement, we are still a way out from returning to the pre-pandemic norm.

This means continuing to work to ensure our entire supply chain

1. Kirkland, Washington-based Astronics is an industry-leading manufacturer of aircraft electrical power systems

2. EmPower UltraLite G2 USB In-Seat Power System – a powerful and intelligent Passenger Electronic Device (PED) power solution

is customer focused, allowing us to work even closer with our airline, In Flight Entertainment (IFE) and seat supplier partners to ensure minimal disruption to aircraft fleet planning, aircraft deliveries and post-delivery modifications. To be honest, we've learned and changed. We've gotten very creative, and we've learned where we can and will be prepared for the next unforeseen supply chain impact.

What are airlines' emerging expectations and how is Astronics helping fulfil them? Do you have any plans to extend your product offering and capabilities?

Most certainly, airlines worldwide have been dramatically impacted by Covid and now the recovery. The Covid slowdown impacted their financial health and now, with such a robust passenger recovery, they find themselves with resource challenges in responding to that demand.

As airlines respond to this increased demand with robust fleet plans and by refreshing and updating their cabins, they have



“WE’VE GOTTEN VERY CREATIVE AND LEARNED WHERE WE CAN AND WILL BE PREPARED FOR THE NEXT UNFORESEEN SUPPLY CHAIN IMPACT”

290

Astronics has over 290 global airline customers and provides systems for all customer types

three expectations of Astronics. Firstly, continued innovation in terms of latest technology, system architecture and efficiency to ensure they maximise this opportunity to update their fleet. Secondly, they expect solid on-time delivery and quality performance to not negatively impact their fleet expansion/refresh.

The third expectation is flexibility and continued communication during a time where global supply chain challenges are impacting multiple areas of their business.

The UltraLite GEN2 system was our big announcement heading out of the Aircraft Interiors show, and we've had a lot of interest in the system. Beyond that we continue, just as we did during the slowdown, to reinvest in the Astronics cabin power portfolio.

Where do you see the overall market heading and what influences will come to play?

Right now, the aerospace industry is working through both global supply chain challenges and a tight labour market, and that will likely continue into early 2023. That said, even amidst this environment, airlines are putting firm plans in place to update their existing fleets with an increased focus on sustainability and total cost of ownership, and that includes in the cabin environment.

We see airline demand of newer more fuel-efficient aircraft and systems validating the increased linefit production rates the major OEMs have published and are working towards. Astronics Cabin Electronics group is positioned to support that growth in the coming years. ©



EXPONENTIAL!

This year's APEX/IFSA EXPO offers visitors the most comprehensive opportunity to network with industry leaders and help shape the future of the end-to-end passenger experience

APEX/IFSA EXPO 2022 will be held between 25-27 October at Long Beach, California and will serve – as it has always served – as a vital resource for the businesses and professionals that create, deliver and manage the airline passenger experience.

APEX/IFSA EXPO is one of the few events run by the industry for the industry, offering a raft of opportunities for visitors to hear the unique insights of airline chief executives, senior directors and influential decision makers and meet with leading exhibitors demonstrating all the latest innovation and technology.

As global non-profits, the Airline Passenger Experience Association (APEX) and the International Flight Services Association (IFSA) reinvest all their resources to serving members, strengthening the worldwide airline industry, advancing thought-leadership, fostering business opportunities via events, representing members in advocacy issues, developing global initiatives, setting key airline standards, and highlighting well-deserved recognition across the aviation industry.

2022 will see the second EXPO since the COVID pandemic recovery, with organisers believing it will top last year's performance with a vibrant exhibitor space and a conference agenda that boasts the participation of the industry's most influential leaders. In fact, a 30 per cent increase in the number of exhibiting companies has forced organisers to exploit every inch of the exhibition halls.

Influential aircraft manufacturers Airbus and Boeing will be in attendance as will APEX and IFSA's many airline members, who make this event a calendar commitment to connect with their industry peers and identify first-hand the emerging technology trends.

The near sell-out status of the exhibition space has been accompanied by a very healthy level of expected show attendees who are as always invited to freely engage with the APEX & IFSA Board members about how they would like future events being shaped.

● For more information about this year's event visit expo.apex.aero

RECOGNISING EXCELLENCE

Each year the industry gathers at EXPO for the most highly anticipated awards show of the season, the APEX/IFSA Awards Ceremony. The top airlines and vendors are recognised for elevating the passenger experience over the last year in the following categories:

● **APEX/IFSA Awards** Airline and supplier members of the Airline Passenger Experience Association (APEX) and the International Flight Services Association (IFSA) honour their peers as they celebrate the newest state-of-the-art programmes.

● **World Class** This premier and audit-based award honours airlines



2

that fulfil international standards of safety well-being, sustainability, service and inclusiveness.

● **The Official Airline Ratings** Created based on neutral, third-party passenger feedback and insights gathered through APEX's partnership with TripIt® from Concur®, Four and Five Star airlines are honoured based on passengers ratings from nearly one million flights across more than 600 airlines.

● **Global Passenger Choice Awards** Leveraging the partnership with TripIt, these awards recognise the top airlines in seat comfort, cabin service, food and beverage, entertainment and Wi-Fi, as rated by their passengers. Winners of the each award will be announced at the APEX/IFSA Awards Ceremony on Wednesday 26 October at the 2022 APEX/IFSA EXPO.

LEARNING FROM THE BEST

Thought Leadership Conference
27 October, 2022

Keynote Speakers include the chief executives of Air New Zealand, Connect, Fiji Airways, Fiji Link, JSX, Los Angeles World Airports and Star Alliance.



1



ORGANISERS BELIEVE IT WILL TOP LAST YEAR'S PERFORMANCE



● **The Future of the Biometric Passenger Experience** Biometrics has advanced across passenger experience, but the transformation is about to dramatically quicken. Airline biometric bag drops have already begun. Alliance airlines will be able to conduct data interchange. US TSA identification of passengers without any ID required occurs at airports across the US.

Airports like LAX enable multi-airline biometric entry and have biometric payment stores coming soon. The end-to-end biometric passenger experience will create incredible opportunities to quicken and improve the passenger experience while maintaining digital privacy rights. Panellists include: US DHS TSA former chief innovation officer Dan McCoy, Los Angeles World Airports CEO Justin Erbacchi and Star Alliance CEO Jeffrey Goh.

BREAKOUT SESSION APEX Tech

● **The Future of Connectivity in the Passenger Experience**

Connectivity is becoming a 'must-have' service for many airlines. Some 17,000 new satellites will come online in the next ten years, and a plethora of new

service providers are entering the IFEC space. What technologies are emerging? What business models are offered? Should airlines turn connectivity over to service providers, or buy bandwidth as a commodity? Come learn what the future holds for connectivity, and then stay for the next session to learn how connectivity and IFE are converging. A panel of experts will discuss these issues.

● **The Convergence of IFE and Connectivity: How edge-caching can be the bridge**

IFE and connectivity are no longer separate services that airlines must figure out how to integrate. They are two paths to the same destination that are incrementally merging into a single service supported by a Digital Experience Platform (DXP). As bandwidth increases and its cost decreases, content storage will begin to move off the aircraft and into the Cloud.

On the ground, this kind of streaming is provided by Content Delivery Networks (CDNs). But today's CDNs do not reach far enough into areas of constrained bandwidth-like aircraft. Moving the edge of the network 30,000 feet into the air is a challenge. Panellists include: Viasat VP of commercial mobility Don Buchman, Panasonic

chief engineer of systems Phil Watson, Netskrt CEO Siegfried Luft, AERQ head of strategy Jonas von Kruechten, Delta flight products VP inflight entertainment Dan Murphy.

● **IFE Content Security of the Future: Introducing the Trusted Partner Network (TPN) – the Cloud Version** The Trusted Partner Network (TPN), a wholly owned subsidiary of the Motion Picture Association (MPA), will make a major announcement at EXPO on the future course of content security in IFE. The focus of IFE content security in the past has been on physical facilities, like post-production and content integration.

However, as content management has moved into the cloud, TPN – under a newly re-organised structure – will now look at both. Learn about how this impacts IFE, a new tiered approach to assessment levels, and how IFE companies can become TPN members and meet the new content security guidelines that will roll out in early 2023. Panellists include: TPN president Terri Davies, a panel of security experts from MPA companies

BREAKOUT SESSION Airline & supplier partnerships impacting the passenger experience

● **Maximising Customer Service, Ancillary Revenue, & Loyalty** Airlines invest incredible funds into their products and services to entertain and engage their passengers. How can revenue be generated from that investment to cultivate an attractive ROI?

● **Designing Sustainable Passenger Experience Initiatives** Each airline has its own angle on sustainability, but the customer perception of airline sustainability varies dramatically. Leading airline executives will discuss the approaches designed to better connect with their passengers in the years ahead. ☺

1. APEX/IFSA EXPO – one of the few events run by the industry for the industry
2. Exhibitors demonstrate all that is innovative
3. Visitors will learn how connectivity and IFE are converging



OWNING THE SPACE

Inflight connectivity has become an incredibly complex subject with airline customers facing many unknowns about exactly how industry providers will evolve.

Aimée Turner spoke to several providers about how they are structuring their respective technology roadmaps

The satellite industry is moving through enormous change with fresh investment into new networks such as OneWeb, Starlink and Amazon's proposed Kuiper network raising the prospect of greatly improved passenger inflight connectivity (IFC).

But one of the key questions that airlines are trying to work out is who will be the key IFC providers by 2025?

Alongside that thorny issue is the risk of airlines selecting an IFC provider that either falls by the wayside or fails to deliver promised services, as is the possibility of an airline selecting an IFC provider that may be delivering an acceptable service today but ultimately falls by the wayside as competition delivers improved services. After all, the overall cost of replacing satcom IFC equipment and then having to install new equipment is high and unlikely to be accomplished outside of a major aircraft upgrade or heavy maintenance activity.

Airlines also appear to be moving to a free-to-use model for passengers which is expected to drive up aircraft bandwidth demand substantially, a critical consideration when satcom service providers are plotting their capacity roadmaps out to 2030.

Ben Griffin is OneWeb's vice president, mobility. He says the business is constantly reviewing capacity based upon market demand, which is currently very high. "We're evolving our capacity needs and the design of the constellation to ensure we are able to deliver. This will come in the form of multi-orbit IFC solutions, but also in significantly



Each of Inmarsat's networks brings its own unique strength



enhancing our own low Earth orbit (LEO) offerings to provide more of that low latency, high bandwidth global coverage that customers will come to expect."

Although LEO satellites have a lower life-expectancy than those of their GEO cousins, Griffin says this actually provides an opportunity to refresh technology more often and ensure OneWeb is best placed to remain agile and respond to market trends. In August, OneWeb – widely regarded as the launch LEO player in the cabin connectivity field – signed a global distribution deal with Intelsat to offer airlines what the partners hope proves to be a seamless IFC solution with the best combination of performance, coverage and reliability in the market.

The partnership will enable Intelsat to distribute OneWeb's LEO satellite services to airlines worldwide, coupled with Intelsat's extensive IFC experience and existing geostationary (GEO) satellite service. "The result is a truly multi-orbit solution for the aviation community," says Jeff Sare, Intelsat president of commercial aviation. "With OneWeb, we are leveraging the best capabilities of both companies' networks."

William Huot-Marchand, senior vice president, inflight connectivity at Inmarsat believes that, on their own, LEO networks are poorly suited to meet aviation's connectivity requirements due to their limited capabilities. They are most useful as part of a multi-dimensional network. He points to Inmarsat's Orchestra, created to address this need by combining its Ka-band Global Xpress (GX) and L-band ELERA networks, which are both GEO, with LEO, together with terrestrial 5G.

"This provides aviation customers with the right capacity in real-time, whenever and wherever they need it for many years to come," he says. Each of these networks brings its own unique strength and each will have its role as more airlines start to offer more demanding, bandwidth-hungry applications and services that require advanced capabilities.

Are there any indications over which IFC satcom service providers will still be around offering aviation their services in 2025 and beyond? Satellite connectivity expert Paul Bedward says tracking the likely result of the inevitable satcom industry consolidation will be key

to predicting what is likely to be available. In less than 12 months, he says, the industry has already witnessed Viasat entering into the process of an acquisition of Inmarsat; and OneWeb and Eutelsat entering in to talks, as have SES and Intelsat.

Bedward says the industry may see the first signs of corporate distress once funding for new networks starts falling off. He identifies OneWeb as needing substantial investment, hence the current discussions with Eutelsat. It remains to be seen however whether Eutelsat shareholders have the appetite to invest the business's substantial cashholding in bankrolling OneWeb's second generation satellite rollout to allow it to move beyond its current network limitations.

"To a lesser extent, Starlink also requires extensive funding to roll out its second generation network," he says. Bedward however flags Amazon's proposed Kuiper network which originally had a fourth quarter 2022 launch date as looking highly viable in the longer term in terms of technology.

ESA terminals

Aero terminal are also of interest with much news of developments associated with new flat panel electronically scanned array (ESA) type terminals. Here, Bedward sounds a note of caution, saying the marketing of these terminals versus the capability and availability for commercial aircraft installation is 'blurry to say the least'.

Even so, Intelsat's Jeff Sare is championing the business's new ESA antenna as the first-ever multi-orbit IFC solution, built on



"This provides aviation customers with the right capacity in real-time"

WILLIAM HUOT-MARCHAND



"The result is a truly multi-orbit solution for the aviation community"

JEFF SARE



"We're evolving our capacity needs and the design of the constellation to ensure we are able to deliver"

BEN GRIFFIN



OneWeb is constantly reviewing capacity based upon market demand

an integrated infrastructure that relies on hundreds of satellites in both geostationary and low-earth orbit providing airlines, and their passengers more IFC capacity and speed in more places.

By harnessing the power of multi-orbit capabilities with both the network and ESA antenna, Intelsat says airlines and their passengers will no longer have to accept significant gaps in IFC coverage or capacity even at busy hubs, across oceans and over polar routes. "Intelsat will seamlessly manage connectivity, allowing passengers to remain connected no matter where they are," says Sare.

Griffin says the terminals used by LEO satcom provider OneWeb will be based on ESA technology which will be highly reliable since, based on its lack of moving parts, it will be far easier to maintain by airlines.

ESA terminal design is certainly more suitable for operation on LEO networks due to terminal heat generation issues, although Bedward notes that Airbus, which is an investor in OneWeb, has yet to move forward in offering a OneWeb terminal programme on its aircraft types. In fact, after an extensive industry selection exercise which featured an assessment of the near-term availability of suitable ESA type systems for its

customer airlines' routes, Airbus recently announced that it was introducing the ThinKom VICTS type antenna system as Selectable Seller Furnished Equipment.

On this, Griffin tells Aircraft Cabin Management that it remains fully engaged with all its OEM partners and driving the LEO revolution of IFC through linefit. "It is important to stress here," he says, "that OneWeb understands the importance or working with our industry partners – we believe this will not only lead to faster linefit implementations, but it will also give aircraft operators a better solution that is fully endorsed by the OEM community."

Mobile terminals

Another key point of interest is the mobility market as opposed to static terminal offerings which is now of particular interest to satcom service providers who had ignored this segment.

Bedward explains that many of the established satcom providers focused their satellite network design and services on static terrestrial customer services such as broadcast TV, remote internet, backhaul of data/voice telecom, etc. With the optical fibre rollout and 4G/5G mobile network expansion, these high revenue customer markets

are shrinking, forcing many established satcom service providers to start focusing on the mobility market area (i.e. terminals that move over land, sea and air).

However, the satellite network design for terminals on the move is different to that for static terminals and even more so for fast moving aero terminals that may travel thousands of kilometres through numerous international regulatory regions with different rules on handling passenger internet traffic. "It is on everyone's radar, but the challenge will be developing terminals that can talk to the different LEO and GEO constellations in addition to the network capabilities to allow aircraft to move seamlessly between these resources," Bedward explains.

Service Offering

One burning question remains however: have airlines figured out exactly how passenger connectivity fits into their overall cabin service offering to the passenger? For Bedward, the critical questions are: if it's provided as a free service, what capability is to be made available? Basic messaging, basic web surfing, email or IP TV channels? Or will a highly reliable high bandwidth service simply allow the airline to dispense with inflight entertainment (IFE) equipment and media content altogether? Or does the well-used try-before-you-buy model still have a future?

"It's noticeable that the more experienced North American airlines that have already moved through several generations of IFC now bring the actual passenger requirements to the heart of their next generation tenders and RFPs," says Bedward, who adds that no longer is the discussion simply about how many mbps up/down and at what price mbyte they can provide. "The requests are now far more complex with the passenger's required type and level of service placed at the heart of the negotiation."

Even if such a service was available today, questions would remain over how to afford it and how to measure the quality of the passenger's service. "Recent IFC selections by major US-based airlines have placed enormous attention on the latter," says Bedward, "such selection requirements being the reason that new satcom IFC providers have not been down selected in early selection rounds." ©



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SUPPLY IN DEMAND

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Servicing the aftermarket and ambitious aircraft production rates look set to place huge pressure on the cabin interiors industry. Aircraft Cabin Management's Aimée Turner examines how the appetite for innovation will be best fulfilled

Tom Williams, the one-time chief operations officer of Airbus, once joked that the European airframer's fortunes were hostage to the smallest link in the supply chain, the manufacturer of the most humble part like the toilet door – but without which the aircraft cannot fly. It was contingent on the one-man band working in a garage with only his pet dog for company. Should the dog get sick, the guy in the overall would fail to make even the simplest part that day.

As Nathan Kwok, an executive vice president of Safran Cabin, pointed out

at an industry event this summer, there are a million and one parts of an aircraft but it only takes one part to be missing for the aircraft not to deliver. He outlined the supplier's dilemma: "It's like trying to hit a bullseye. You have to plan for the forecast rates which will be at the top of the range which is the stable part of the demand – and then you have to plan for the unstable part – the aftermarket uncertainties." He drew an analogy of Forrest Gump's box of chocolates in that, often as a supplier, 'you never know what you're going to get'.

"There are an infinite number of permutations in terms of meeting the true demand needs and you have to surf through all the layers of the supply chain

to find the particular points of failure," he said, adding that the challenge is to factor in the mix of an airframer's customer base and the likely aftermarket demand profile before attempting to develop a capacity plan to fall back on – one that takes into account what could go wrong without 'over-capacitising' and risking going bankrupt. Kwok admitted however that not every supplier has the resources to draw up such highly sophisticated industrial plans which allow for the appropriate levels of back-up capacity.

The current global landscape for manufacturing logistics and staffing is more challenging than ever across all industries, including aviation. Airbus' ambition to produce 75 A320 aircraft



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every month over the next three years is a hugely ambitious case in point, representing as it does a 66 per cent increase of aircraft currently rolling off the factory line.

With commercial aircraft operations returning faster than any could have predicted, the rate of increase in orders for both original equipment and aftermarket components has waterfallen swiftly down to the sub-tier supplier.

Many parts of the cabin supply chain have certainly had to pivot during the pandemic, being forced to rebuild their infrastructures to support increasing costs and workforce requirements while trying to maintain on time shipments and minimum order quantities.

For Jeff Luedeke and Gary Weissel of Tronos Aviation Consulting the ongoing post-pandemic troubles have been compounded by the uncertainties surrounding the worldwide grounding of the Boeing 737 Max in March 2019. Despite attempts by the US airframer Boeing to shore up its supplier base, when production looked likely to shut down for a protracted period, the aircraft's suppliers had to move fast to trim capacity.

"Everything starts with forecasts," Luedeke says, "and when you don't have a forecast, the suppliers of raw materials will deplete stock. You also had early retirements or people who just left the industry faster than was expected. Now that we have the forecasts, with orders being placed, you are seeing a struggle to get raw material production back up to the required levels and, from highly



3

technically skilled people down to entry level, finding labour, especially in the United States, is a real struggle."

Then came the pandemic in 2020 which saw the aftermarket for interiors completely collapse and forced many suppliers to cut up to 50 per cent of their staff, shutter factories and consolidate production facilities. "People simply went into survival mode," says Weissel.

Despite the best efforts of airframers to ramp back up, Weissel guesses that even now forecasts will fall quite a way short of reality. From the supplier's perspective, that lack of accuracy may express itself in a lack of confidence in the marketplace.

Weissel, an expert in aircraft interiors programme management, says, "Recently we have started to see suppliers begin to have a more inward view, as in asking themselves 'Can we deliver?' and 'Let's be careful about what we are committing to'. Lately, Weissel has noted leading seat suppliers failing to bid on new business: "We're guessing it will either be an internal issue with their own supply chain or with labour."

THE CURRENT GLOBAL LANDSCAPE IS MORE CHALLENGING THAN EVER ACROSS ALL INDUSTRIES

Has the pain been shared equally across the cabin interiors industry? Luedeke reports that the MRO side has been less impacted and that last summer, when aircraft started flying, business came back very quickly. "The new part of production was harder hit," he says, "not just for linefit for Airbus and Boeing but also for new seats, new galleys, new lavatories going into retrofit programmes. Those programmes have restarted, that's for sure but we're nowhere near where we were pre-pandemic."

That's due to a number of reasons, Weissel reports. Most importantly, interiors generally constitute discretionary spending and a cash-strapped airline is not going to reconfigure its aircraft when it cannot afford to. "They can live for a very long time with a slightly substandard configuration," Weissel says, adding that the retrofit wholesale market, sizeable as it is, won't make a reappearance any time soon until multiple strong quarters of airline financials return.

Supply chain optimisation

The highlight of this year's Aircraft Interiors Expo (AIX) show in Hamburg was undoubtedly the industry coming together after such a long time. And, with people coming back together so too does the demand to travel and order books to fill. So what is the current status of the aircraft cabin supply industry and how are best practitioners adapting to the challenge?

Ben Smalley, aviation business development manager at advanced materials business Sekisui Kydex, arguably speaks for the whole industry

1. Thompson Aero Seating has debuted the VantageDuo concept
2. Kydex RCL is fulfilling a renewed interest in sustainable products
3. STG's Universal Lighting system can be used in a broad range of OEM applications



2

BUSINESSES HAVE BEEN DRIVEN RIGHT BACK TO FIRST PRINCIPLES

when he says that these challenges will continue as aviation returns and ‘will require original equipment manufacturers (OEM) to forecast and communicate their ramp up early to allow suppliers to proactively prepare rather than react’.

Pre-pandemic, OEMs were reacting to ‘just-in-time’ inventory strategies. It was all about moving parts quickly between North America and Europe, according to Sohaib Ahmed, programme manager, interiors at AJW, who says that this was fine when supply chains were

replete with components, but when persistent shortages arose – as was the case with semiconductors – the rhythm was interrupted.

Aviation supply chain integrators such as AJW Group, says Ahmed, have reorganised themselves to endure lower volumes. The result is the business’s effort to bake in unprecedented levels of efficiency to satisfy customer demand. “In turn, this has driven an increase in supply chain digitalisation and led businesses right back to first principles in re-crafting how they need to operate,” he says.

AJW Technique Interiors exhibited at this year’s Aircraft Interiors Expo in Hamburg for the first time, showcasing its fully tailored solutions for cabin interior needs and the design development and production of replacement seat covers using the advanced synthetic leather SkyLeather.

In terms of supply chain optimisation, Martin McGuinness, head of supply chain development at Thompson Aero Seating, says that supplies constrained on a global basis and ever-increasing lead times has forced the business to review its local supply chains to assess capability and suitability for rapid response to standardised programmes, while taking a risk-based approach to low cost sourcing options further afield.

“Cutting the shipping time of items that are frequently required makes business sense and is also positive in supporting other companies within its own region, something that is important to Northern Ireland-based Thompson Aero Seating,” he says.

Managing costs

A fragile supply chain can also lead to spiralling costs, as AJW’s Ahmed notes. Pre-pandemic lead-times of between 2-4 weeks have doubled to 8-10 weeks at times, which has dramatically affected project lead-times with escalating prices seeing the cost of hard materials, including raw leather, etc, tripling in some instances. It is also not just an issue of sourcing materials but regulatory aspects can further add to the supply chain cost burden.

“The process of procuring replacement seat covers is a notoriously lengthy process due to design and technical approvals, flammability and combination burns testing,” Ahmed explains. “As such, by the time the approvals are finalised, which often takes over four weeks, the price of material has changed due to



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1. AJW Group has reorganised itself to endure lower volumes

2. The designers and engineers who created the VantageDuo started from scratch with a blank sheet of paper

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ALONGSIDE SUPPLY CHAIN DELAY ISSUES, COSTS ARE INCREASING ACROSS ALL CATEGORIES

the shortage and demand of raw materials, and the inflated price of leather.”

Thompson's McGuinness agrees that along with delays across the supply chain, costs are increasing in all categories. “This adds pressure to each programme and to the distribution network,” he says. This pressure has seen the business rely heavily on forecasting to achieve optimum batch-sizing and vendor-managed inventory policies. Introducing service-level agreements and long-term contracts with strategic partners has also enabled Thompson to provide visibility and commitment across various programmes.

Managing capacity

Constraints in capacity are leading to longer demonstrated lead times and supplier performance issues. With the entire supply chain now pushing to increase

material output, at different rates of recovery, OEMs need to have invested early in supply chain risk mitigation, according to Sean Padfield, senior vice president, aerospace at Schroth Safety Products.

“Earlier this year, Schroth opened its new Fort Lauderdale facility with increased operational capacity,” Padfield reports. “Their enhanced ability to absorb surges in sub-tier material deliveries with increased available stock levels is mitigating their OEM risk of material bottlenecks impacting customer delivery commitments.”

Thompson's McGuinness adds that his business has introduced a watch tower process to ensure suppliers are not overloaded with excess demand. He says this offers the supplier the best opportunity to meet their quoted lead times and a proactive balance of capacity versus demand. “An improved supplier relationship-management process enhances the connection with key suppliers and allows for more effective, efficient, open, and collaborative communication,” he explains.

Another elephant in the cabin is the whole issue of recruiting and retaining a world class workforce. “Supply chain shortages are not just linked to semi-conductors, repair capacity or the dramatic reduction in air freight capacity,” says AJW's Ahmad, “they also extend to human resources.”

Work-life balance

He reckons there has been a significant reappraisal across the labour market, with individuals rescoping their lives, rejecting the once-accepted commute, as people search for an improved work-life balance. There has also been a minor shift of staff out of aviation into less volatile sectors, placing even further strain on a limited talent pool.

With 100 patents to its name, innovation is central to STG Aerospace strategy which made several important product launches throughout

↑
Aerena – AerQ's platform for digital engagement – can offer airlines an opportunity to shorten their own digital supply chains

100

With 100 patents to its name, innovation is central to STG Aerospace strategy which made several important product launches at this year's Aircraft Interiors Expo

1. Infused Imaging is an award-winning, proprietary process that embeds imagery into Kydex Thermoplastics
2. Schroth's new Fort Lauderdale facility has increased operational capacity



COMPANIES THAT REORGANISED WILL HAVE AN ADVANTAGE OVER THOSE WHO SIMPLY SURVIVED

this year's Aircraft Interiors Expo, including the world's first blue glowing photoluminescent emergency floor path marking system. Pierre Michard, STG director of sales & programmes, believes that the aerospace sector remains an attractive one to anyone interested in technology and the exciting innovation aspect of aerospace. "The key skill we are looking for beyond technical competence is curiosity," he says. "We need all our designers to be inquisitive, as well as technical – the two together are the magic formula."

Ahead of the curve

So how does a cabin interiors business maintain its competitive edge through innovation in such turbulent times?

Kydex's Smalley believes that companies that reorganised during the pandemic – investing in manufacturing automation, research and innovation and workforce development – will have an advantage over those who simply survived. "This will lead to exciting innovations as the industry rebounds," he says. Kydex itself showcased its innovative Infused Imaging at this year's Aircraft Interiors Expo, a Crystal Cabin Award-winning, proprietary process that embeds imagery.

Verena Bintaro at AerQ, says long supply chains can hinder the implementation of innovation but that digital tools such as Aerenia – AerQ's platform for digital engagement – can actually offer airlines an opportunity to shorten their own digital supply chains for new applications and media content onboard the aircraft. "Airlines benefit from time and cost savings due to simpler and faster operational workflows in development, testing and deployment of applications and content," she says.

Thompson Aero Seating also created a stir at Hamburg this year with a brand-new long-range single-aisle seating concept, the VantageDuo which started from scratch with a blank sheet of paper. Staying ahead of the curve is vital but so is collaboration, says McGuinness: "The design team and the supply chain team work closely together so that both can stay ahead of the trends," he says. "Knowing what new materials are likely to be needed, what the customer wants, and how design and engineering is evolving, allows the supply chain to lead with planning and forecasting."

Smalley certainly agrees with the need to be responsive to customer concerns such as the rising relevance of sustainability.

"The key to accomplishing this is early collaboration among the supply chain including OEMs, designers, engineers, and cross industry experts," he says, pointing to Kydex's move to recycle thermoplastics for aviation interiors.

Showcase opportunity

The importance of industry events such as the Aircraft Interiors Expo cannot be underestimated for those bringing innovation to market as AerQ's Bintaro notes, in so much as they represent a vital showcase for products that not only meet but also anticipate their potential customer's needs. "The business's contact with airlines, at this year's AIX and beyond," she says, "has demonstrated that airlines are realising that the digitalisation of their cabins is a crucial factor in implementing their own new business models and to create a competitive edge."

STG Aerospace's Michard certainly remains committed. Following the acquisition of STG by Head-Up Technologies, the business is now planning for next year's show, leveraging the experience of both teams. "AIX is the best opportunity to showcase our innovations and capabilities to customers and the industry as a whole," he says. ©

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COMPLETELY IN THE COMFORT ZONE

How do airlines and their suppliers ensure the passenger's onboard experience is one which takes into account their complete wellbeing?

Bernie Baldwin speaks to some of those offering solutions

SITTING PRETTY

Even when you're not the person controlling a vehicle, travelling can be quite tiring. Sitting in roughly the same position for even a relatively short can affect the whole body. Doing so for many hours almost certainly does. Managing factors such as humidity control, the materials in contact with the passenger, plus food and beverage requirements are among the methods to ensure the traveller's overall wellbeing.

Having boarded, the first sensation for the passenger is the general feel of the material with which they are in contact as they settle into their seat. What they experience comes from a process involving discussions between

the supplier and the airline about the attributes of the seat covers.

"Passenger perception of comfort can differ hugely from person to person, but can also be influenced by their overall travel experience and the emotions they are feeling at that particular time," remarks Louise Gear, director of transport at ELeather. "With the Covid pandemic, passengers became increasingly aware of the cleanliness and hygiene of their seat.

"Discussions vary with each airline but, in general, we find the most common criteria they look for include: overall seat comfort, driven mostly by the shape, foam and feel of the finished cover; the ease of cleaning and hygiene properties;

and the durability, sustainability, weight and performance of the materials," Gear explains. "The list is long, but the demand from airlines to work on carbon reduction is high, so more sustainable products offering high-performance are on the up."

Matthew Nicholls, sales director at Tapis Corporation, agrees that, for the most part, the major airlines know what they're looking for. "Low-cost carriers (LCCs) may not have as big a department dedicated to such things, so they rely more on the suppliers for their support," he says.

"Two great examples include JetBlue and Allegiant. JetBlue with their new Mint 2.0 suite and dress covers on their A220 were very involved with us, the



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seat cover company (Sabeti Wain) and the cushion supplier (Tuft & Needle). The airline wanted to ensure that their seat places were the best in class in terms of comfort. Tuft & Needle are renowned in the US for their expertise in comfort cushions and mattresses. What they lacked in aviation experience was where JetBlue, Tapis and Sabeti made up the ground technically to create the final product.

“The JetBlue team had received complaints from passengers about them feeling hot and sweaty on longer flights and asked us to help solve that problem,” says Nicholls. “Our Promessa AV product has a layer of foam embedded between the fabric backcloth and polycarbonate top-skin that acts as a heat-wicking layer. The heat dissipating power of the foam ensures the passenger is able to maintain a thermal equilibrium which prevents their body from kicking in to cool them and sweating.”

Allegiant are in the process of launching a new interior design and improving their passengers’ comfort is crucial. “They reviewed a wide selection of materials and, as part of the process, had demonstration seats manufactured by different material providers, then asked their staff for feedback, ranking the seats on various physical criteria,” Nicholls recalls. “The Promessa AV product won comprehensively in terms of comfort, haptic and aesthetic quality.

“Once they selected the materials, we hosted them for a workshop where we



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evaluated the build of their passenger places with pressure mapping technology to determine the correct thickness, density and type of foams and other materials used for maximum comfort.”

Tapis products all contain anti-microbial material as standard and are all hypoallergenic and vegan – all increasingly important factors in the decision-making process.

Lantal’s EVP aviation interiors Luzius Rickenbacher cites a number of key criteria when airlines make their selection. For example, regarding the breathability of a material – allowing air circulation – he believes that of a textile is “by far better” compared with leather or synthetic leather.

“Furthermore, on a textile the passenger does not slide. Most people perceive the sliding effect on leather or synthetic leather as uncomfortable. On

A TEXTILE HAS MUCH BETTER SOUND ABSORBING PROPERTIES THAN LEATHER

top of that, temperature control is easier with a textile. Leather is hot in summer and cold in winter,” he argues.

In terms of sustainability, bio-degradable fabric and leather both meet the highest sustainability requirements, Rickenbacher notes. Moreover, textiles are shipped on rolls, while leather is shipped as hide, so the cut loss is much smaller when rolls are used, which means better sustainability.

“Noise is also key aspect of whether a passenger feels comfortable or not. This criterion is forgotten way too often. A textile has superior sound absorbing properties compared with leather or synthetic leather,” he adds.

“There are many points to be considered and really depends on the positioning and strategy of the airline, which material is the better selection. It is important to have a holistic view at this choice and not just focus on one criterion,” Rickenbacher emphasises.

1. For Lantal, the breathability of a textile is preferable to leather or synthetic leather

2. Textiles being shipped on rolls means the cut loss is much smaller, improving sustainability



THE HUMIDITY LEVELS IN AN AIRCRAFT CABIN CAN BE DIFFICULT TO CONTROL

The flights an airline offers also affect its choice of material. Seats for airlines which operate short/medium-haul flights have multiple cleansing actions each day whereas those for long-haul have the passenger sat for quite some length of time.

“There is a huge difference in the material for short vs long-haul,” states Rickenbacher. “On leather and textile the product can be manufactured to achieve lighter material, improved durability performance and so on. Again, it depends on the positioning of the airline whether cost is at the core or the passenger is at the core of doing business.”

Trends as well as perception by the customer also play their part, Nicholls says. “Traditionally, almost all aircraft seat covers were made from fabric. It wasn’t until the early 2000s that mass adoption of leather occurred.

“It is common for long haul seats to be made from fabric due to the perception of fabric as being more breathable for long distances,” Nicholls notes. “For their Mint 2.0 suite though, JetBlue chose Promessa AV for the main seat cover and are very pleased with its performance and comfort on their long-haul routes. Advances in technology have made it possible to provide similar levels of comfort with synthetic leather (like our Promessa AV) that also has a high perceived value in line with a business or first class experience.”

Louise Gear observes how coated materials are more easily cleanable on-wing, whereas fabric usually requires removal from the seat. “This adds cost in terms of staff hours, spare covers and cleaning costs. In general we see short-haul flyers looking to switch to coated solutions to help with shorter turnaround times between flights. Long-haul flyers also consider how a material looks, especially after prolonged periods of use. They want the same level of cleanability, but also a high quality appearance that lasts.”

COMING UP FOR AIR

Suitably seated, the next parameter where the passenger requires high quality is the air in the cabin. Hygiene factors such as the temperature are controlled relatively easily, but the humidity – or lack of – is much less so.

CTT Systems has been balancing the levels of humidification for some time. Its lead product nowadays is an inflight humidification (IFH) system, Humidifier Onboard, developed after assessing the ways in which biological and physiological factors react to low humidity.

“An aircraft cabin is incredibly dry, often as low as 3-6 per cent relative humidity (RH) in a premium cabin,” explains Ola Häggfeldt, CTT’s sales director. “In the flight deck, there is almost no humidity, while in first and business class, premium passengers enjoy leading comfort and best services, but it comes with a price – a cabin climate more dehydrating than any place on Earth.

“The body’s natural moisture balance on a long-haul flight is therefore

50%

While AirShield reshapes air flow from the vents, it does not alter the cabin temperature or the volume of air supplied beyond that of a traditional air vent. It is also 50% quieter than a traditional vent to promote passenger rest time

disrupted, causing dry air-induced fatigue, rapid degeneration of the immune system and impaired taste. It's important to keep the immune system intact during a flight and, even more importantly, at arrival when entering the terminal building," Häggfeldt remarks. "The RH required for a premium cabin is about 20 per cent."

Peter Landquist, CTT's VP senior advisor sales, adds, "We could humidify the premium class up to 35 per cent, maybe even 40 per cent, but then you need a drying system too. It's a trade-off – stop the dehydration process and still provide a lightweight, easy-to-install system and not take too much water because the idea is an extra water tank to increase humidity should not be needed."

There is a big move across airlines towards Premium Economy cabins, again reducing passenger density. So are airlines asking for Humidifier Onboard in that cabin too? "Not yet," Häggfeldt reports. "They're more focused on first and business class. But if you've humidified those, you will indirectly increase the humidity in premium economy. With recirculation, premium economy might go to somewhere between 10 per cent and 14 per cent."

Finally, while CTT's humidification products have tended to be on widebody or business aircraft, that may change, with aircraft such as the A321LR/XLR. "The trend to develop narrowbody airliners for intercontinental long-haul will drive humidification for premium cabin in this segment as well. It's available already as a retrofit," notes Landquist.



Not only does cabin air need the right humidity, it needs to be as fresh as possible, particularly in the wake of the Covid-19 pandemic. Passengers need to feel comfortable with the air passing through, not only for their physical wellbeing, but their mental health too.

Pexco Aerospace's AirShield, which uses the air system's nozzles to create protective air barriers in between and around passengers, has been drawing attention as a viable product in this area. It is now on the verge of certification.

In developing AirShield, Pexco had to determine the optimum airflow to enable each air barrier to be effective. The company's president, Jon Page, explains the methodology behind the tests to achieve that.

"The big thing we had to consider with AirShield was how airborne particles behave in a cabin full of people, with nobody wearing a face mask. To understand the scale of the problem, we modelled more than 60 million data points of CFD (computational fluid dynamics) to get a definitive picture of what was happening to airflow in the cabin on a particulate level," Page begins.

"Our results found aircraft cabins to be highly efficient at exchanging and cleaning the air in considerable volumes.

But our research also discovered that we could enhance performance by adapting the airflow around passengers using the existing vents. In doing so, we found we could restrict droplets from every sneeze, cough or breath, as well as unwanted odours passing into passengers' personal space, while doubling how quickly these particles are sent to the HEPA filters to be replaced by purified air.

"From the outset, we wanted AirShield to be easy to install and certify, which meant maintaining the existing air volume in the cabin but making it work differently," Page continues. "We performed numerous testing procedures, including dB level, g-force, flammability and laboratory fog tests. We also completed on-wing tests with American Airlines, Southwest Airlines and Alaska Airlines. These tests in real cabin environments proved, without doubt, the advantages of the technology."

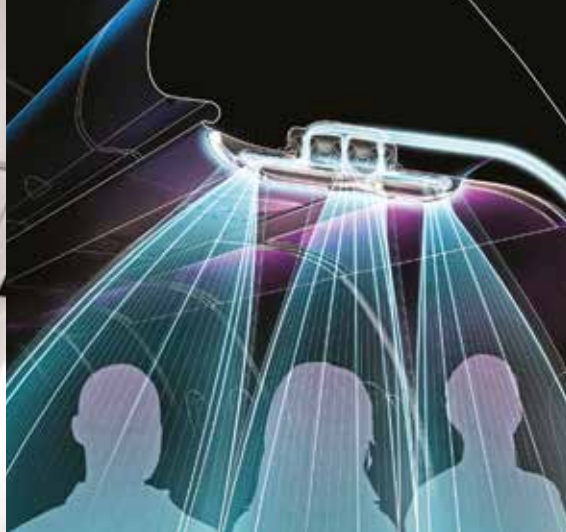
Some passengers are averse to air flow directly onto their face, but Page says that AirShield does not do that but blows

1. AirShield uses the air system's nozzles to create protective barriers between and around passengers

2. Airshield is easy to install and certify, maintaining the cabin's existing air volume



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around and in between passengers. “You will not feel it blowing on your face as you sit in your seat,” he assures.

“While AirShield reshapes air flow from the vents, it does not alter the cabin temperature or the volume of air supplied beyond that of a traditional air vent. It is also 50% quieter than a traditional vent to promote passenger rest time,” he adds.

AirShield’s nozzle tips are inspired by industrial ‘air knife’ technology. During the development process, Pexco prototyped more than 20 versions which were 3D printed. “These rapid iterations empowered our engineering team to refine the performance of the technology,” Page says. “They ensured we could achieve the desired impact without modification to the existing cabin airflow system or any recertification to the seating.”

Extra certification costs money, of course. Also, for innovations like AirShield, regulatory authorities sometimes need to create new standards or benchmarks to ensure a system does what it claims. Page reports that Pexco did not set out to rewrite the rulebook. “At every stage of the development process, we ensured AirShield could be certified for the A320 within the existing regulatory framework. Its unique three-piece assembly is lightweight (less than a pound), incredibly durable, and quick and simple to install,” he confirms.

“AIRLINES CAN MAKE A FEW CHANGES TO ENSURE THE SAFETY OF PEOPLE WITH ALLERGIES”

CATERING FOR ALL

One of the benefits of good cabin humidity is the ability to taste things better, so the sustenance on offer can be appreciated properly. And while many passengers refresh themselves with the main menu, special food and beverage requirements are increasingly needed to meet travellers’ allergies, dietary needs and religious provisos.

A leader in delivering special meals is Creative Nature, whose founder and CEO Julianne Ponan began the company due to her own allergies. “I have anaphylaxis to peanuts, tree nuts, sesame, chickpeas, lentils and more. Some of my allergies are airborne, which makes flying a whole different ball game,” she explains. “I believe, however, that airlines can make a few changes to ensure the safety of people with allergies on board.

“The foods that cover the most airborne allergic reactions are peanuts, tree nuts and dairy. The reaction does differ per person depending on the severity of their allergy. For example, my allergy to peanuts and tree nuts is so severe that I cannot even shake hands with someone who has touched nuts without having a reaction. So if someone is eating nuts on board and then I sit in

the same seat and touch the table/seating area, I could have a reaction,” Ponan adds.

“Airlines should not sell or serve peanut and tree nuts on flights as the cost of a diversion is over £80,000 per flight.

I have created a snack that is not just peanut and tree nut free, but caters for the top 14 allergens, halal and kosher, meaning that airlines do not have to miss out on sales; plus they have a delicious product inclusive to all passengers. Airlines need the safest options without carrying ‘may contain’ products,” she advises.

Marc Warde, owner/director of another leader in the specialist meals field, Niche Free-from Kitchen, begins with a reminder of which foods trigger allergic reactions. “The seven most common food allergies are eggs, cow’s milk, tree nuts, peanuts, shellfish, wheat and soy, but there are many, many more,” he states.

“The World Allergy Organization has advised all airlines to stop serving nuts, but this has been broadly ignored. Nuts or peanuts are the most known allergy and if you have a severe nut allergy some airlines will ask people to refrain from eating nuts on board, some will not,” Warde reports.

“Most scheduled airlines offer special meals, but the codes for those are 34 years old, broadly out of date with modern dietary and allergy requirements, and ungoverned. We take a more modern approach to this, using modern dietary advice on medically required meals and our meals for allergy passengers are guaranteed to be free of the allergen,” he confirms.

“We also combine allergy types as it’s entirely plausible – and even likely – that passengers can be gluten-free and diabetic or vegan for example. Or follow a religious diet, but also have a food allergy.”

1. AirShield’s nozzle tips are inspired by industrial ‘air knife’ technology

2. Using the existing vents, AirShield enhances air flow, doubling how quickly droplets are sent to the HEPA filters

DIEHL
Aviation

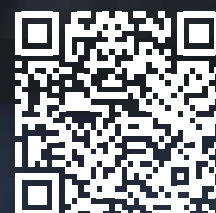
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1. Products that can cater for multiple areas is key when budgets are limited
2. Products free from the top 14 allergens are by default vegan and vegetarian

80K

Airlines should not sell or serve peanut and tree nuts on flights as the cost of a diversion is over £80,000 per flight

1

Mention of vegan meals is important as there have been changes in the demand levels for these and vegetarian meals in recent times. “Veganism or plant-based eating has grown significantly in the past two years,” Warde comments. “This is not just based on a wish not to consume animal-derived products, but also for health and sustainability. Plant-based food sales were up 27 per cent in 2020, topping \$7 billion, according to the Plant Based Foods Association.”

Ponan has also observed this rise, but notes, “Veganism is still a choice whereas having an allergy is a need state and this is growing year-on-year too, with 1 in 12 children now having a food allergy and there being a 75 per cent increase in anaphylaxis hospital admissions. Having safer products on board though, free from the top 14 allergens, means by default that the product is vegan and vegetarian.

As for dealing with religious provisos, Ponan believes that at present, halal and kosher meals are more readily available

than meals guaranteed free from the top 14 allergens. “The struggle is greater when looking for a religious meal and needing a specific dietary requirement,” she remarks.

The variation in religious provisos regarding what can or cannot be eaten is considerable. “IATA has codes for seven religious diets for which airlines will make some provision, though not necessarily for all of them,” Warde reports. “There are 4,700 recognised world religions, many of which have very specific eating requirements, which would be practically impossible to cater for. Muslim (halal) and Jewish (kosher) faiths are usually well catered, as broadly speaking a vegan/plant-based choice satisfies most other religious requirements. Jain and fruitarian diets are harder to cater for as numbers are very low and, factually speaking, orthodox Jains who require the diet wouldn’t fly. Buddhists, however, may also choose this diet rather than a vegan diet.”

With such a multitude of permutations, an airline catering operation has a tough job to decide what it can offer, given the finite limits on its budget and facilities (for example, nut-dust free, kosher, halal and so on).

Warde agrees. “It is almost impossible for airline or airport flight kitchens to safely produce allergen-safe meals. Now that all ingredients have to be listed (Natasha’s Law, which requires all food outlets to provide full ingredient lists with clear allergen labelling on Pre Packed for Direct Sale (PPDS) foods), flight kitchens must mark foods as ‘may contain’ or have alibi labelling, rendering those meals entirely unsuitable for anyone with a food allergy,” he explains.

“Using specialist partners like us, who advise airlines and travel organisations on setting up policy and special meals, but also offer guaranteed allergen-safe meals and modern dietary meal options, seems the only choice,” Warde continues. “This is a model learned from Japan where they have 28 listed allergens and have been using dedicated special meal providers for some years.

“Allergen laws, which differ all over the world, are increasing, as are allergies. There has been a 300 per cent increase in child food allergies in the past two years in the UK and Europe and a 370 per cent rise in the US. It’s not going away.”

Ponan agrees that there is only so much an airline can do to accommodate everyone while staying commercial. “This is why they need to rely on brands which guarantee a ‘no may-contain’ policy,” she emphasises. “Looking for product that can caterer for multiple areas is key when budgets are limited as, even though this product can be premium, it means an airline would not have to stop selling their bistro service because of a nut allergy. Instead they have an offering for all,” Ponan declares.

And that’s a situation every airline would surely prefer to see for their passengers’ wellbeing. ©

2



“ALLERGY IS GROWING YEAR-ON-YEAR – 1 IN 12 CHILDREN NOW HAS A FOOD ALLERGY”

Idea first. From outline to airline.





HOME FROM HOME



Aircraft Cabin Management discusses with experts at the vanguard of innovation about how pandemic consumer habits have laid the foundation for a passenger-driven revolution in terms of inflight entertainment

The move to more advanced onboard technologies has been undoubtedly accelerated by the Covid-19 pandemic as airlines seek to fulfil the expectations of their passengers who became far more technology-literate sitting in the comfort of their home during lockdown, writes Aimée Turner.

But what do passengers really want now in these less turbulent, post-Covid times? Have their needs tangibly changed and what does that mean for the future of inflight entertainment?

Ben Griffin, vice president mobility, OneWeb, thinks needs and motivations are evolving and that these emerging passenger behaviours are quite new compared to what the inflight connectivity and entertainment (IFE) community has seen before.

He says this on the basis of new research which the satcom services provider commissioned through wanting to understand what really matters to airline passengers as travel resumes in a post-pandemic environment. Understanding that could go some way, he says, to helping the airline industry better cater to future passenger needs by leveraging super-fast and super-reliable in-flight connectivity – which is what OneWeb is evidently planning to offer.

The results were published during the latest Aircraft Interiors Expo in Hamburg in June and there were some interesting ramifications for IFE system developers. Namely, that although the research acknowledges that the skies are in many ways the last realm of disconnection, the benefits of IFC are becoming far more compelling and extensive, with the potential to positively impact the entire travel experience – which includes enhancing passengers' interaction and engagement with IFE.

OneWeb is certain that airlines will need to provide high quality IFC as a standardised part of their offering once it is available. "The expectation

for home-equivalent connectivity is growing – and will continue to grow, as the younger, digitally sophisticated generation takes to the skies," it says.

Consumer demand

Andy Masson, vice president product & portfolio management at Panasonic Avionics Corporation, agrees and points to the business's own research that has demonstrated a similar shift – not only in behaviours, but also expectations. The high-level conclusions of Panasonic's studies reveal that a multiscreen experience has become a significant way of life for the passenger who has become highly accustomed to remote working from home and who has therefore heavily integrated their use of devices which has become the 'in situ' norm.

That willingness to run integrated multiple devices means that for the first time tablet technology has become arguably more relevant than its laptop equivalent in the aircraft cabin. This emerging reality together with a desire for consumer-grade technology, accompanied by a slick industrial design element, constituted items on a design wishlist that became a starting point for reflection for Panasonic. "Aerospace had started to lag behind," says Masson, who spent lockdown thinking about how to achieve significant weight savings through exploiting advanced screen and power supply technology. He came up with the outline for what is now known as Astrova – launched at this year's Aircraft Interiors Expo – which is an IFE system which boasts consumer-grade thin screen technology and substantially lighter weight overall.

Alongside features such as high-fidelity audio, dedicated 67W of USB-C power to fast-charge passenger devices and programmable LED lighting, the cinema-grade 4K OLED screens with High Dynamic Range (HDR) allows passengers to connect their own devices to create their own multi-screen, multi-purpose environment to which they became so accustomed at home during the lockdowns of recent years.

↑
Astrova boasts
consumer-grade thin
screen technology



Safran's Bluetooth technology is a strong contender in terms of future-proofed innovation

WHILE NOVELTY FUNCTIONS ARE FUN, THEY ARE UNLIKELY TO BE ANYTHING MORE THAN THAT

Fulfilling the demands of a more demanding clientele is certainly having a discernible impact on how manufacturers are approaching system design – but are manufacturers driving themselves too hard, too fast to innovate? And will the pressure to innovate mean some risk taking a technology path that results in their chosen solutions becoming prematurely obsolete?

For David Whelan, an IFE expert at UK-based Valour Consultancy, the best way to proceed is by listening to what passengers – and by extension, airlines – really want. “This typically means steering clear of flavour-of-the-week trends and focusing on getting the fundamentals right,” he says.

Whelan believes that what most passengers want from IFE systems is a quality screen with an easy-to-use interface and a broad array of interesting content, warning that while novelty functions can be fun for travellers they are unlikely to be anything more than that.

Whelan adds that the one trend which is a real value-add for passengers is the introduction of Bluetooth-compatible IFE systems which allow passengers to connect their personal headphones.

“Given the state of this market on the ground, this is a pretty safe bet for IFE vendors. We’ve seen this technology come to market in recent years and rolling this out successfully could be an important differentiator over the coming years,” he says.

He identifies Safran's Bluetooth technology as a particularly strong contender in terms of future-proofed innovation. Safran, Whelan says, has managed to design the technology to create a 3-4ft conical shape which isolates the range to the individual passenger seat, preventing the chaos of having multiple passengers trying to work out which IFE system to connect to.

Forward looking

Michael Childers is a content management consultant with 43 years' experience in inflight entertainment who chairs the Airline Passenger Experience Association (APEX) technology committee, and has been lauded for his leadership in the digital transformation of the passenger experience. In terms of hardware, he salutes industry players such as Panasonic which has identified the need to swap out components of

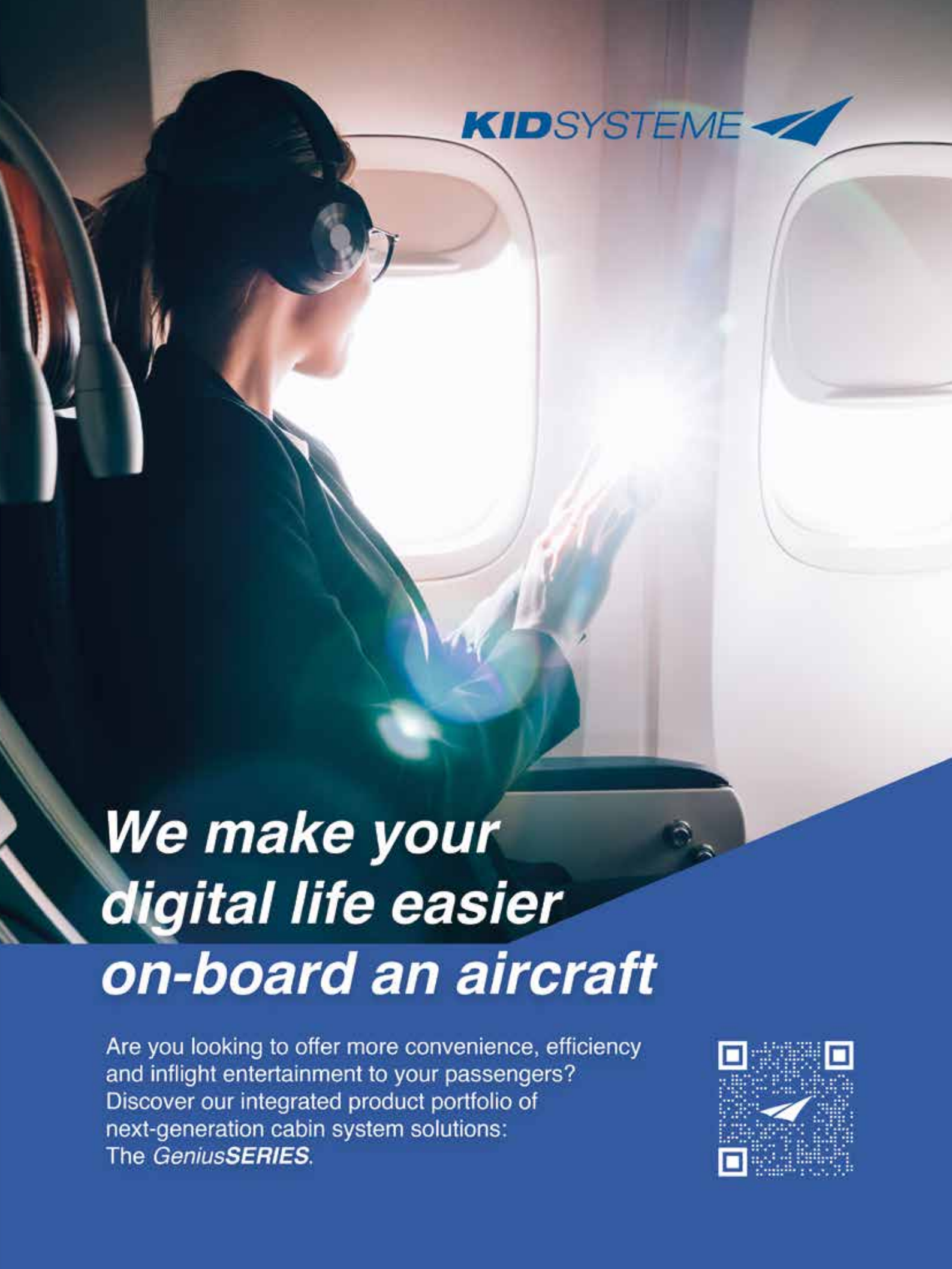
the system rather than risk leaving the original technology on board for 10 years in an effort to move quickly when new business models and competition from open systems architectures emerge.

Panasonic's Masson says the business did indeed want to counter a risk of built-in obsolescence through making Astrova modular as this flexibility would not only allow carriers to update cabins without a complete or costly interior change but would also offer the ability to swap out components such as the USB-C charging unit of Bluetooth transmitter without having to change the whole screen. “It immediately stops being a device and starts being a platform with the software also enabling much more flexibility,” he says.

According to Childers, there is a conversation, albeit uncomfortable, that many IFE system providers need to have because of the impactful changes to the passenger experience as a result of the pandemic, all of which combine a social, business and technological evolution in the way that content is consumed.

“During the pandemic,” he says, “cinemas closed and there were constraints on social gatherings, making the consumption of content at home much more important.” He explains that this phenomenon accelerated content providers' adoption of direct-to-consumer (D2C) services like Disney+, HBO Max, Paramount+ and Peacock. Exponential growth in such services took place during the pandemic and, as cinemas began to re-open, most of these services – with the notable exception of Netflix – have continued to grow.

Childers notes that the early window advantage of cinemas – often some 90 days or so in advance of home entertainment – has been reduced



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1. Passengers want IFE systems with an easy-to-use interface and a broad array of choice
2. The passenger will provide the content, the airline will provide the pipe

CACHING INTERNET CONTENT IS ALREADY COMMON PRACTICE

to around 45 days, with the previous window likely gone forever. IFE's early window of some 60 to 90 days after box office release remains, and so therefore immediately places IFE at a disadvantage against the 45-day D2C window.

"But the most important change is in the business model," says Childers. "D2C enables the content provider to license content directly to the consumer via subscriptions, disintermediating the preponderance of intermediaries like DVD suppliers, and the providers of satellite, cable and over-the-air television."

This means that some years from now, as connectivity bandwidth increases and its cost decreases, passengers are likely to access their own D2C subscriptions on the aircraft and airline licensing of content will be largely a thing of the past.



The passenger will provide the content, the airline will provide the pipe.

Childers says that the reality today is that IFE revenue for content providers is tiny in terms of total average gross for a box office film and as soon as a D2C division of a studio believes it will make more money by telling a potential subscriber that access is universal even at 30,000ft, the resulting growth in its subscriber base will mean it can easily walk away from IFE licensing deals.

Delivery mechanism

Even so, as Childers notes, you still need to have a delivery mechanism to back up that new business model. That should come when connectivity bandwidth increases with availability, accompanying costs decrease and there are new ways to get the content to the aircraft using technologies such as onboard edge caching using onboard servers.

He says that could take up to a decade to become a reality, although airlines should not struggle to see the sense in investing a significant average annual spend on licensing in supporting any additional costs for providing the pipe.

The industry remains reluctant to talk about charting a migration path that integrates IFE content and connectivity into a single system however. Indeed, it's a difficult conversation to be had both in the IFE divisions at studios and at the system provider level because it means a major change in the way the current system is organised. "IFE is not dead, far

from it," says Childers, "it's simply some elements that are changing: how content gets to the aircraft and how it's paid for."

He predicts that IFE and connectivity will no longer represent separate services that airlines must figure out how to integrate. Rather, they are two paths to the same destination that are incrementally merging into a single service supported by a digital experience platform and that, as bandwidth increases and cost decreases, content storage will begin to move off the aircraft and into the Cloud.

In the home environment, he points out, Content Delivery Networks (CDN) do a respectable job of enabling streaming. However, in environments like aircraft, trains and ships, CDNs are instantly constrained. Caching popular internet content at the edge of the network is already a common practice among internet service providers as a means of addressing this issue. But reaching subscribers in these more constrained inflight environments will require the use of smaller, deep edge CDN providers.

The Streaming Video Technology Alliance (SVTA) already has an open-caching working group addressing these issues, with the participation of IFE companies like AerQ, Hughes, Intelsat, Netskrt, Panasonic, Thales and Viasat. In addition, the APEX technology committee addressed this issue at its May TECH Conference and Workshop and will revisit edge caching at APEX EXPO in Long Beach in October and plans to do so again in early 2023.

Childers understands that there will likely be significant resistance from major system providers in the market who are heavily invested in the status quo and, as for most businesses facing radical change in terms of industrial models, it could be those which are not heavily invested in the past that thrive.

Within the IFE delivery industry, it could well be businesses employing cloud-based workflows who can respond from the time they receive a mezzanine file to the time they can deliver content integration within 48 hours as opposed to 45-60 days that will prevail. ©

A photograph of an aircraft cabin interior, showing rows of blue seats and overhead storage bins. The cabin is illuminated with a cool blue light, creating a modern and comfortable atmosphere. The perspective is from the front of the cabin looking down the aisle.

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GET SMART

While digitalisation is bringing greater levels of personalised onboard experiences to the cabin, crew, maintenance and airline operations are also set to benefit from a smart cabin.

Alexander Preston finds out more

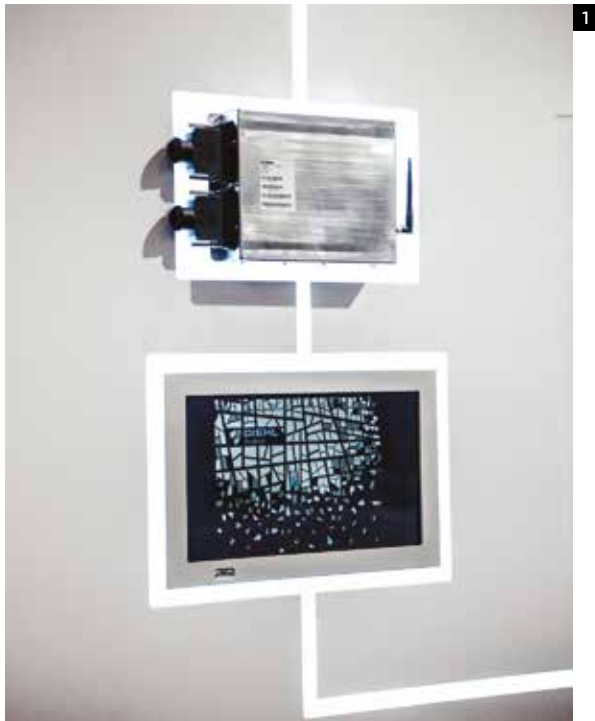
Talk of digitalisation seems to be everywhere within the aviation industry currently, but digitalisation has long been part of the conversation and will remain so for a long time going forward.

Low cost carrier easyJet prides itself on embedding innovation into its DNA. As far back as 2015, the operator appointed its first head of data science, Alberto Rey Villaverde, to accelerate its use of artificial intelligence (AI)

Villaverde's team used AI and advanced data analytics to address and enhance predictive maintenance, resource planning, flight scheduling and easyJet's loyalty programme.

Other airlines have seen the value in establishing management teams to oversee digital strategies. Just this year, Delta created the new role of chief digital officer, appointing Eric Phillips to 'drive a

Illustrations: Phil Couzens



“DIGITALISATION IS A KEY PLAYING FIELD TO DRIVE EFFICIENCY”

Eurowings Discover network, although the duration of the testing period is not defined yet.

For Diehl Aviation, ‘digitalisation is an opportunity to optimise our end-to-end process with digital continuity throughout the product lifecycle and at the same time unlocking new customer value’.

Lothar Trunk, programme manager innovation and a senior expert in cabin systems at Diehl Aerospace adds, “Our customers will benefit from digitally enhanced shorter development cycles as well as from intelligent technologies and connected products in the aircraft cabin”, an approach exemplified by the company’s role as project lead in 2019’s i+sCabin research programme, supported by funding from the German Federal Ministry of Economic Affairs and Climate Action (BMWK).

Together with a consortium including Bühler Motor, Diehl Aviation, Jeppesen, Etihad Engineering, KID-Systeme, Safran Cabin Germany, The Boeing Company, Hamburg University of Technology and

multidisciplinary approach to deliver an unparalleled customer experience’.

Elsewhere, as part of an alignment of its organisational structure to execute an ambitious strategy of sustainable growth, digital transformation and central focus on customer experience, Rakel Óttarsdóttir was appointed chief digital officer of Icelandair Group at the beginning of the year.

Operating out of Frankfurt and Munich, Eurowings Discover, the new leisure airline of the Lufthansa Group, strives to make leisure travel ‘the most easy and joyful experience’ beginning with the booking process through to the onboard experience.

To achieve this goal, the airline says it is focused on a human-centric digital strategy that is based on three pillars: e-commerce (i.e. flight search and bookings), digital self-services and onboard entertainment.

Complementing the free seatback inflight entertainment is the airline’s Onboard Cloud, through which passengers can access more content such as games, e-journals, travel guides and onboard shop via their own personal electronic device.

Eurowings Discover’s recently announced partnership with AerQ is the latest strand of the airline’s digital strategy, and one which unifies the aforementioned pillars through the selection of the open platform Aereana.

Supported by a state-of-the-art cloud-based infrastructure, the Aereana

seat-centric system will be trialled on an A320 aircraft, giving passengers enhanced inflight entertainment, including a personalised selection of movies, TV series, games, and e-journals.

Additionally, an e-commerce offer in the skies allows passengers to order food and drinks directly to their seats. Passengers can also make final travel arrangements on board by booking tours and activities at their destinations via their IFE screen. Further applications can be accessed in a second screen (PED) environment.

According to the airline, the test aircraft with the fully-fledged Aereana in-seat system will operate flexibly on short and medium haul flights of the

1. With CANSAS, Diehl offers a highly reliable communication backbone

2. The Aereana system will be trialled on an A320 aircraft





1. The Diehl CANSAS control panel bundles almost all cabin-related functions
2. Touchscreens form the main interface of the cabin management

1

the Baden-Wuerttemberg Cooperative State University, i+sCabin introduced the world's first intelligent cabin.

As Trunk explains, the i+s Cabin Team highly supports the Cabin Secure Media Independent Messaging (CSMIM, APIM19-004) communication standard under development within the ARINC Cabin Systems subcommittee. It is expected that the released standard will be available in 2025.

"We were able to show that the idea of a common communication platform for future smart cabin applications is working," states Trunk. "Using the Boeing ecoDemonstrator flying test bed in 2019, we flew test installations of the i+sCabin system, including prototype intelligent galleys, seats, lavatories, lighting and applications.

"This early interoperability testing across all of the i+sCabin partners in a real aircraft environment enabled all of us to learn faster and move forward on improvements much quicker and with greater fidelity in defining their value."

The i+sCabin programme ended in December 2021. However, the next chapter, the i+sCabin2.0 programme, commenced in January, with Diehl Aviation once again the nominated project lead. This is in addition to cooperating with Diehl on 'smart boarding' where the company is developing the necessary components and processes for monitoring and accelerating boarding and deboarding.

Working alongside associate partner Neveon in the overall programme, various sensors and sensor networks installed in Neveon seat cushions enable the monitoring of passenger movement. For example, it is possible to see when passengers take or leave their seats. The seat sensor data thus collected serves to optimise the boarding process and hence the flight, which means that the interval between landing and the next take-off can be minimised.

Another focal point is investigating the integration of active surfaces on cabin components, where surfaces can actively change their decor, appearance or a display, and obtain this information from the i+sCabin network.

A very important work package is addressing the automation of cabin inspections. Currently these inspections are performed manually by systematically searching the cabin for damage such as scratches, fractures, dirt, etc. Documentation is hand-written with found anomalies forwarded to the manufacturer and processed there.

This is therefore a very error prone and cumbersome process. The goal of the work package is to automate this process as far as practical, examining all process steps for their digitalisability and automatability and thus considerably simplify cabin inspections.

Neveon is also involved in investigating the use of artificial intelligence in preventive maintenance in cabin

installations such as the water, wastewater, seat adjustment, ventilation and galley subsystems. Integration of the Greiner Intelligent

Seat, which is a seat cushion equipped with sensors, facilitates the collation of data regarding matters such as seating comfort or the expected lifetime of comfort materials. Using appropriate algorithms, this data is then utilised in different application environments – seating, cabin, maintenance system.

The first research results are expected in mid-2023, when it is intended to present the core innovations in a technology demonstrator, provided by Boeing subsidiary Jeppesen, where all hardware and software will be tested.

As a partner in the i+sCabin2.0 research project, Jeppesen is focused on creating an operational digital twin of the aircraft cabin to improve maintenance and records management processes for airlines and aircraft lessors.

Standardisation is also a key priority for the research, with a goal to generate a generic standardised platform for the implementation of digital products and services for passengers, crew and maintenance operations.

Like many of those involved in the programme, Diehl is constantly transferring its knowledge from the study programme into its products. Trunk reveals that the company is currently in discussion with customers – undisclosed to date – for the next generation of cabin management systems including the new cabin communication standard CSMIM.

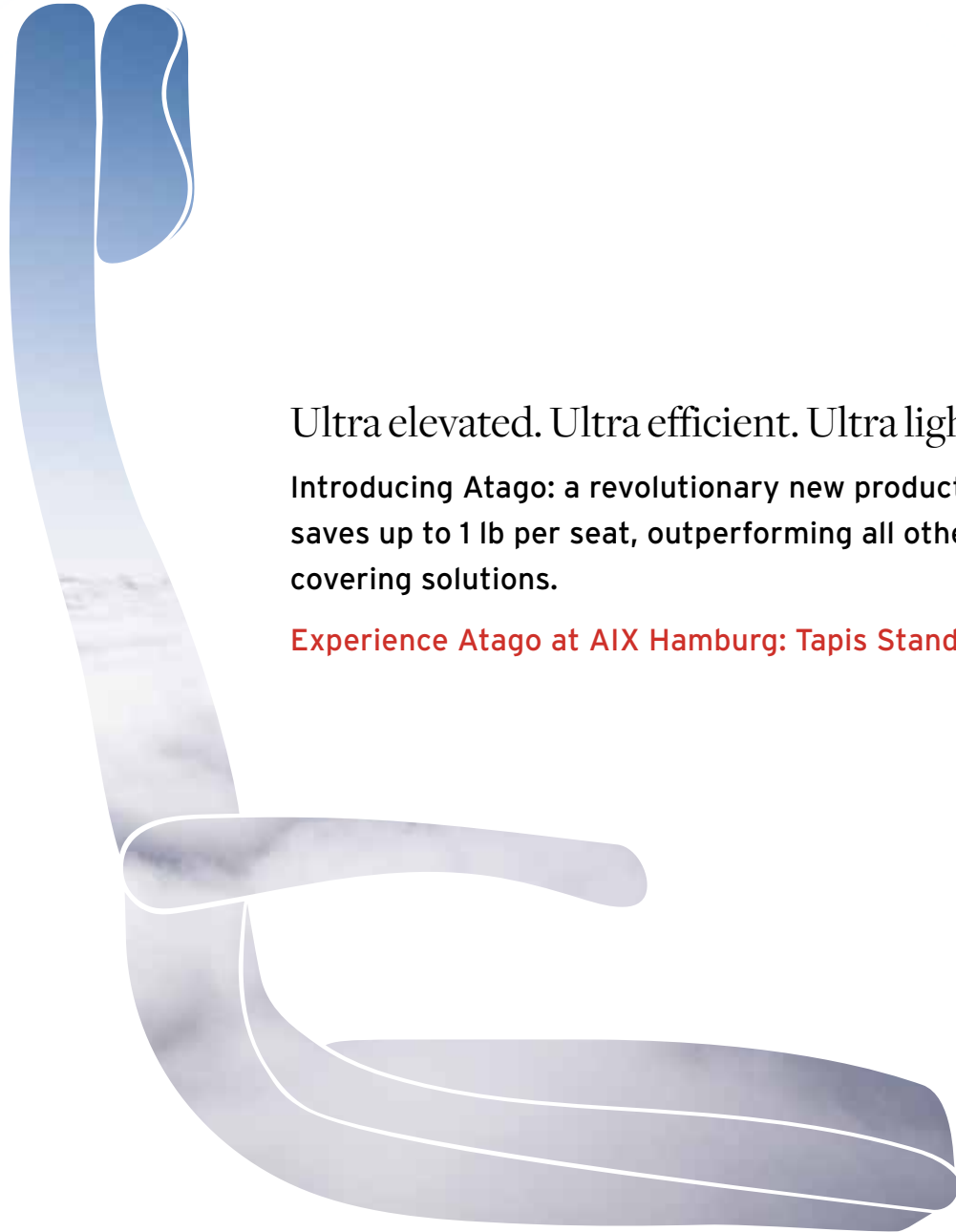
As Trunk sums up, "digitalisation therefore is a key playing field for us to drive efficiency and deliver new value to all players along the travel value chain." ©

2



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READY FOR THE RUSH

Arizona-based Ascent Aviation Services specialises in every aspect of aircraft maintenance from narrow to wide body, small to large, regional to long-haul aircraft, and is one of the largest storage and reclamation operations in the world. **Aimée Turner** spoke to its chief commercial officer Scott Butler to learn more about his business whose services are in huge demand as the industry recovery continues

ACM: Scott, you've undoubtedly been in the eye of the storm as the aviation recovery continues. Can you give us an idea of the scale of your operation and how your customers are coping with the pressures of returning to operations?

SB We're a full-service maintenance, repair and overhaul (MRO) business and we also have a storage and transition facility in addition to a large reclamation business, so we maintain aircraft from the cradle to the grave so to speak. It has been very challenging for the operators and certainly for the lease companies – especially those leasing businesses that don't have the large technical supply chain footprint that operators have. Even so, they've been really ramping up their technical



Scott Butler is chief commercial officer, Ascent Aviation



1

knowledge and have become much more proactive in their approach, counting on us as an MRO to help them keep these aircraft moving. A lot of our business is with leasing companies on work involving transitioning aircraft. That means lots of new interior refreshes and prepping interiors for cargo conversion. It's quite an exciting time and we're seeing a lot of valuable aircraft assets being pushed to get back in the air.

We're hearing a lot about supply chain issues compromising the speed of the industry's recovery. What has your experience been?

There's no doubt that supply chains are causing havoc across the board. Obviously,

during the pandemic, a lot of maintenance was not carried out and a lot of maintenance service providers really ramped down to the minimum. On top of that, operators did not want to spend any money they didn't have to get things up and running.

Compounded with that was the fact that a lot of leasing companies were taking over aircraft which had been returned in a less than pristine condition in the scramble to get aircraft off the books. So now, leasing companies are also competing with operators to get into the shops to get the proper certifications and configurations carried out. That means that lead times for interiors, safety equipment, oxygen bottles, etc are close to being a year when normally the lead time would only be 20 days.

You work very closely with your clients to keep their aircraft well maintained. What advice can you offer outside your business?

The advice must be to do some advance planning. Typically for a leasing customer that knows there is going to be a transition and is planning for that, that usually takes 90 days from start to finish. Before, they would not have started with cabin interior or supply chain items until the transition had reached the mid-way point.



2



3

Now, our guys are removing the components right from the minute the aircraft arrives, starting to get those components overhauled, to track immediately to take that uncertainty out of it, and also to start procuring some of those long lead items well in advance.

You have worked in this industry for 15 years, including time with Safran and Rockwell Collins. How would you say the industry has changed during that time?

Airlines and leasing companies used to have a typical profile where they operated a certain age range of aircraft, getting rid of aircraft at a certain age or leasing cycles. You also had many customers who would only operate, say, passenger aircraft although now we see a lot more customers who have diversified their mix in terms of type and age of aircraft.

“THE WHOLE SUPPLY CHAIN HAS HAD AN EDUCATION ABOUT HOW TO FIREFIGHT”

Also, the leasing companies have been buying up a lot of assets in recent years and they have reached the point where they are actually controlling a lot of not only the business but also the technical side, which they typically did not do before. The result is they have much stronger technical teams and are much more involved in the asset mixes and purchasing, so they definitely have a bigger say in what's going on and how the aircraft comes to market.

What do you see happening over the next year?

The whole supply chain has had an education about how to firefight and deal with supply chain issues. Hopefully, things will improve but with new aircraft production starting to ramp up, and with more aircraft operating, that could just exacerbate the issue.

You're going to see some shops that cannot increase capacity start increasing pricing as well as attempts to reduce lead times. One good thing is that airlines are only doing essential work – they're not doing cosmetic maintenance, huge interior refreshes or painting if at all possible.



4

So the good thing is that the strain on the supply chain is arguably not as great as it could be, but it's going to be those critical path items that cannot defer that will continue to cause delays. ☹

1. Ascent Aviation is a full-service MRO business
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Typically for a leasing customer that knows there is going to be a transition and is planning for that, that usually takes 90 days from start to finish

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Out with the old, in with innovation

Aircraft Cabin Management speaks with *Gary Girard* at Cobalt Aerospace whose team of engineers develop optimal ways to solve persistent problems

Innovation is a word used with increasing regularity in the aerospace industry, most often to describe each new, shiny technology that promises to change the way we fly forever. Far less attention is given to the everyday problems faced by operators such as issues concerning cost, maintenance and reliability.

Innovation is not just about trying to create something new for the future; it can also be about finding new and exciting ways to improve on the solutions of the past. Gary Girard, commercial director at Cobalt Aerospace, heads a team of engineers doing exactly that.

INNOVATION CAN BE OPTIMISING WHAT ALREADY EXISTS

ACM: Tell us more about your approach – which issues are airlines struggling with?

GG: We work closely with people from all levels of the industry – buyers, engineers, and designers – hearing about the problems they face. Perhaps these are operational niggles, costs they feel are too high, or ways they feel the travel experience could be made better for passengers. There's often an element of frustration: people know the fix is needed, but it doesn't exist as a solution yet.

That's where we come in. We often look at solutions that have been used for years in a basic form and completely overlooked. Often, older products or components are inefficient: sometimes they are clearly no longer fit for purpose and cabin crew and operators have been struggling with them for quite some time.

Innovation isn't always about creating something completely new – sometimes it's about optimising something that already exists. We also don't believe that innovation is a 'once and done' kind of thing; it should be an ongoing process, a continuous development that can change as new technology becomes available. It's almost a little arrogant to think you have discovered the best solution to a problem, and that it can't ever be improved on!

Can you give us an example of a product like this?

So, let's take floor path marking. This is a crucial safety requirement that aircraft absolutely must install to be allowed to fly. Older systems were electric and

↑
Cobalt Spectrum, an award winning drop-in LED mood lighting system



1



2

“MAINTAINING QUALITY FOR PASSENGER SAFETY AND REDUCING COST IS A HUGE DEAL”

demanded extra power from the aircraft. Then photoluminescent floor path marking reached the market, which was a great step up and much more efficient, requiring no power as it was charged by the cabin lighting.

Unfortunately, behind the scenes photoluminescent systems take a while to manufacture due to an involved printing and drying process. This lengthy manufacturing time pushes the price up for customers. In response, we developed a different way to make an even better product.

Our engineers took inspiration from automotive industry mass manufacturing techniques to condense the process into one bespoke machine. As a result, we've optimised our method so the same high-quality product costs us far less to make,

generating a dramatic cost saving that we pass to our customers. For a product required to meet regulations, maintaining quality for passenger safety and reducing cost for operator benefit is a huge deal.

You recently released a new product at Aircraft Interiors Expo – the USB Reading Light. Does that product fit the same kind of brief?

Yes, absolutely – it's our solution to two common problems. One is retrofitted LED reading lights, which we are frequently asked for, but have found the high cost of LED bulbs versus the usual incandescent bulbs prohibitive for customers. The other common complaint from both operators and passengers is the distribution of in-seat power, which is often exclusive to business class, usually thanks to the time and financial investment required to install and maintain in-seat power in a large number of seats.

The USB Reading Light is a retrofit module that is a direct replacement for the existing reading lamp. Passengers can enjoy 7.5 W of USB power to charge their devices, alongside an upgraded personal LED reading light. The USB Reading Light is designed to be quickly installed during routine maintenance with no additional wire looms, special tools or extra power required.

This product is extremely cost-effective, allowing airlines to offer USB

power at each and every seat – keeping both passengers and operator happy!

When it comes to developing a new solution, how do you balance passenger and operator needs – is one a priority over the other?

Surprisingly, no! The two go hand-in-hand: if we're helping operators to be more efficient in one area, they'll have the freedom to spend in another area to improve the cabin for passengers.

Cobalt Spectrum, our award-winning drop-in LED mood lighting system, is a great example. It could seem like the primary appeal is to passengers, as a beautifully lit cabin enhances the travel experience. However, we've designed this product so that behind the scenes it also meets the weight, cost and maintenance requirements of operators, whilst making life easier for crew.

For instance, we recently released a wireless controller which ensures crew can easily and intuitively operate Cobalt Spectrum with no training required. We believe if our products meet the needs of operators and crew, there can only be a positive impact on passengers. ☺



3

1. The USB Reading Light is designed to be quickly installed
2. Cobalt Spectrum meets weight, cost and maintenance requirements
3. The Cobalt Spectrum wireless controller is intuitive to use

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Waste not...

Why are European rules that were designed 13 years ago to stop the spread of animal disease preventing airlines from segregating, recovering and recycling waste?



Catering waste from within the European Union (EU) is being better processed, recycled and reused than ever before, giving rise to more opportunities to establish a 'circular' economy – one that aims to stop waste being produced in the first place.

And yet, catering waste generated on flights coming from outside the EU is classified by Brussels as Category 1 which requires disposal by incineration or deep burial in an authorised landfill. That continues to frustrate airlines and the inflight catering sector which came together this summer to issue a joint statement demanding smarter regulations around international catering waste (ICW) to reduce cabin waste, recover more material and save costs.

The Airline Catering Association, IATA and the International Flight Services Association (IFSA) along with airlines submitted the recommendation to the European Commission urging it to undertake a review of the ICW risks and change the regulations which block the industry's 'sustainability ambition'.

"EU legislation de facto inhibits reuse, recycling and biotreatment of ICW from outside the EU. In practice, almost everything is burnt – even unopened bottles of waste – or buried when incineration is not possible, in spite of EU airlines and passengers having a strong desire and means to do more in terms of reuse and recycling," the statement read.

Jon Godson is assistant director, sustainability at IATA. He says the sector fully supports protecting animal health but says the industry partners are questioning whether the regulators are focusing on the wrong risk.

IATA has itself commissioned a high level study which concluded there is no evidence that ICW from airlines has ever

The lack of guidance by DG Santé continues to lead to differences

caused an animal disease outbreak, and that no quantitative risk assessments or industry impact consultations were undertaken before the legislation was implemented. It also showed that there is no scientific justification for heat-treated milk and milk products being classified as CAT 1, and that there is more risk of disease from passengers smuggling meat in their luggage.

The CAT 1 classification also directly hampers EU's rules on single use plastics as it means alternative recyclable materials still need to be incinerated or landfilled and that bio-based alternatives cannot be biotreated.

Godson tells Aircraft Cabin Management that despite the industry's best efforts to engage with DG Santé, the directorate responsible for the EU's policies on health and food safety, they refuse to accept that the regulations need revising or even reviewing.

"It seems somewhat confusing that an inflight meal prepared in accordance with procedures developed for the NASA Apollo programme suddenly gets categorised as high-risk biohazardous waste as soon as it is discarded by a passenger," he says, adding that "ultimately, we have to rely

on agricultural inspectors ensuring that airline recyclables are not fed to livestock."

The lack of guidance by DG Santé continues to lead to differences in implementation and application across member states. "We have tried using logic as an argument but now have to resort to issuing public statements in an attempt to get the message across that we want smarter regulation," says Godson, who adds that the industry would fully accept the results of a qualitative risk assessment.

In the absence of action, they are now looking to two initiatives: firstly, planned 2023 trials on transatlantic flights by a number of European airlines that will demonstrate that ICW can be segregated from non-contaminated items; and secondly, a white paper that will use existing scientific evidence to challenge the current regulations and demonstrate how a risk-based approach could work. ©

2023

▲ Industry partners are planning a series of trials on transatlantic flights in 2023 to demonstrate that ICW can be segregated from non-contaminated items

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