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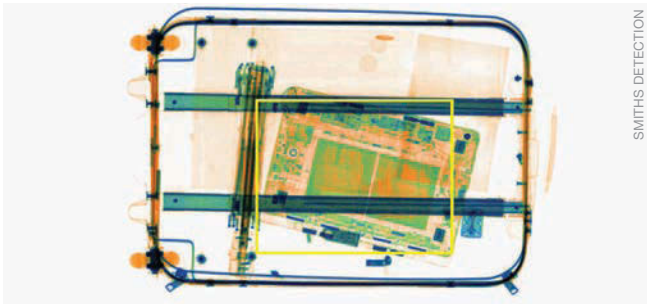
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By Matt Regan

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By Anish Kapoor

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Ground Support WORLDWIDE

PUBLISHED BY
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VOL. 31, NO. 1

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Ground Support Worldwide (USPS 015-386), (ISSN 1934-2861 print, ISSN 2150-4016 online) is published 10 times per year in Feb, Mar, Apr, May, Jun/Jul, Aug, Sep, Oct, Nov and Dec/Jan by Endeavor Business Media, LLC. 1233 Janesville Ave., Fort Atkinson, WI 53538. Periodical postage paid at Fort Atkinson, WI, and additional mailing offices. POSTMASTER: Send address changes to Ground Support Worldwide, PO Box 3257, Northbrook, IL 60065-3257. SUBSCRIPTIONS: Publisher reserves the right to reject non-qualified subscriptions. Subscription prices: U.S. ($62.50 per year); Canada/Mexico ($92.50 per year); All other countries ($135.00 per year). All subscriptions payable in U.S. funds. Send subscription inquiries to Ground Support Worldwide, PO Box 3257, Northbrook, IL 60065-3257. Customer service can be reached toll-free at 877-382-9187 or at circ.groundsupportww@omeda.com for magazine subscription assistance or questions.

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Editor's Note

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Fueling Greener Flights and Ground Ops

Drop-in solutions for jet fuel and diesel fuel can help the industry meet the lofty environmental journey that it has embarked on.

Sustainable air travel has been a significant discussion recently. Stakeholders across the industry are focused on reducing their carbon footprint and making the industry greener.

For example, in 2021, airlines pledged a commitment to achieve net zero carbon dioxide (CO2) emissions by the year 2050. Furthermore, during the 41st International Civil Aviation Organization (ICAO) Assembly last year, officials adopted a long-term global aspirational goal (LTAG) for international aviation of net-zero carbon emissions by 2050 in support of the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement's temperature goal.

With the LTAG agreed to, individual governments can now work toward the same decarbonization goals.

A key component to reaching this goal is utilizing sustainable aviation fuel (SAF). SAF has garnered attention because it's a drop-in replacement that meets all the requirements for jet fuel. According to information released by IATA in December, SAF is expected to account for 65 percent of the mitigation needed to achieve net zero emissions.

Another key moment for SAF occurred in January as Emirates operated a demonstration flight, powering one of the engines on a Boeing 777-300ER 100 percent with SAF. The flight took off from Dubai International Airport (DXB) and flew for more than an hour.

"This flight is a milestone moment for Emirates and a positive step for our industry as we work collectively to address one of our biggest challenges – reducing our carbon footprint. It has been a long journey to finally see this experimental SAF flight take off. Such initiatives are critical contributors not only to the industry body of knowledge, but also to demonstrating the use of higher blends of SAF for future regulatory approvals," Emirates chief operating officer Adel Al Redha said in a release following the flight.

"We hope that landmark demonstration flights like this one will help open the door to scale up the SAF supply chain and make it more available and accessible across geographies, and most importantly, affordable for broader industry adoption in the future," he added.

While the use of SAF continues to build momentum, renewable fuel is having an impact on aviation's greener future on the ground.

Earlier this year, it was announced that ground support equipment (GSE) and other airport vehicles at Amsterdam Airport Schiphol in the Netherlands will be powered by HVO100, a renewable diesel fuel produced by Neste from 100 percent renewable raw materials. Like SAF, HVO100 is a drop-in fuel, which does not require any modifications to existing vehicles or machines, energy systems or fuel distribution infrastructures, officials noted.

According to airport figures, nearly 2,000 ground vehicles with a diesel engine operate at Schiphol. Utilizing renewable diesel fuel will reduce the emissions produced by those vehicles.

"At the moment, 40 percent of the motorized equipment at the airport runs on electricity. And that number will increase over the coming years. However, for a number of specialist heavy vehicles, it is a technical challenge to develop a battery with sufficient capacity that can also be charged quickly enough. Using Neste MY Renewable Diesel is therefore a good solution currently," said Paul Feldbrugge of KLM Equipment Services (KES).

With the lofty decarbonization goals established by the industry, it will take innovative solutions in the air and on the ground to meet these objectives.

Has your company implemented a sustainability project that has yielded positive results? Share your success story with us. Contact me at josh@AviationPros.com. I welcome your feedback on the topic. **GSW**

TOP NEWS

dnata Breaks Ground on $14 Million Cargo Warehouse in Erbil, Iraq

dnata broke ground on its new, 20,000 sq. m. cargo warehouse, which will add significant expansion to its operations at Erbil International Airport (EBL). The facility, which is scheduled for completion in September 2024, represents an investment of $14 million (USD) and will create up to 50 additional, direct jobs with dnata in Iraq.

"We are delighted to expand our operations in response to the growing demand for our reliable and safe cargo services in Erbil," said dnata's senior vice president for UAE and Iraq Airport operations, Jaffar Dawood. "Our new facility will incorporate cutting-edge technologies and the latest carbon reduction initiatives in design and operation, ensuring the highest level of operational and environmental efficiency for our customers. We stay committed to the Iraqi aviation industry and continue to invest in our operations to contribute to the development of Erbil as a regional cargo hub."

dnata's newest cargo facility will be capable of processing 100,000 tonnes of cargo annually, including perishables, pharmaceuticals and dangerous goods. dnata will also implement its "OneCargo" system within the facility, digitizing processes and maximizing efficiencies across its cargo operations in Iraq. dnata's latest expansion follows the opening of a new, advanced cool chain facility and a bus maintenance facility in 2022 at EBL.

Upcoming Events

Feb. 23-25
Women in Aviation International Conference
Long Beach, CA

Feb. 27 – March 1
NBAA Leadership Conference
Charlotte, NC

March 1-3
AAAE / ACC Airport Planning, Design & Construction Symposium
Anaheim, CA

March 27-30
NPMA PETRO 23
Washington, D.C.

April 18-20
MRO Americas
Atlanta, GA

April 21-26
International Aviation Snow Symposium
Buffalo, NY

April 25-26
NATA FBO Success & Management Seminar
New Orleans, LA

SATS Shareholders Vote to Approve Proposed Acquisition of WFS

SATS Ltd. (SATS) shareholders voted to approve the proposed acquisition of Worldwide Flight Services (WFS) at an extraordinary general meeting, and 96.8 percent of the total number of votes were in favor of the resolution to approve the transaction. Voting at the EGM was conducted by poll.

"We are delighted and humbled to have received this affirmative vote of confidence from our shareholders. It is a clear demonstration that our shareholders recognize the strategic value and growth opportunities that this transformational deal will unlock for SATS and all of our stakeholders," Kerry Mok, president and chief executive officer of SATS, said. "We will be better positioned to provide our global customer base with end-to-end solutions, while securing a pathway to profitable growth and uplifting our home-market base in Singapore."

With the receipt of shareholder approvals, the proposed acquisition of WFS now remains subject to requisite regulatory approvals. Transaction completion is currently envisaged for March/April 2023.

Qatar Airways, QAS Earn IATA CEIV Lithium Battery Certification

Qatar Airways has become the second airline in the world to become IATA CEIV Lithium Battery certified and Qatar Aviation Services (QAS) is the first ground handling company to be certified globally. The certification aims to improve safety in handling and transportation of lithium batteries throughout the supply chain.

"Passenger and cargo safety is our utmost concern at all times, and we have continuously advocated for proper regulation in the transport of lithium batteries. We are happy to be the second airline to be certified and we encourage all air industry players to become certified," Qatar Airways group chief executive, Akbar Al Baker, said. "As an industry, we must focus on active risk prevention and that is achieved through strict regulation, training and compliance."

"Lithium batteries play a huge part in our daily life, from the toys we buy for our children, to the laptops we use every day, and the cars we drive, to name but a few examples. Yet, they also pose a huge daily risk for air travel and transport: one that Qatar Airways has always highlighted and worked to prevent as best possible," Guillaume Halleux, chief officer cargo at Qatar Airways Cargo added. "We are happy to see this now starting to happen with air cargo industry companies voluntarily undergoing CEIV Lithium Battery certification."

The IATA CEIV Lithium Battery certification program will ensure the elements of the supply chain involved in the shipment of these batteries are able to meet their regulatory requirements. The CEIV Lithium Battery family is IATA's most recent CEIV certification. It is in line with similar certifications for the handling of pharmaceuticals, perishables and live animals.

PEOPLE

Waev Hires Arroyo as COO

Waev Inc. named Alfredo Arroyo chief operations officer (COO) and a senior vice president of the company. Arroyo will lead Waev's global supply chain and manufacturing operations, ensuring the company's readiness to meet increasing demand and aggressive new market expansions. This step marks the first c-suite executive hire for Waev since the company's founding in 2021.

"The opportunity for Alfredo to quickly accelerate operational momentum comes at a critical time in our business" said Keith Simon, CEO of Waev. "A robust global supply chain and efficient manufacturing operations are paramount as enablers for future success, and Alfredo is the perfect person for the job. We're stoked to have him join the Waev team."

Arroyo brings to Waev a wealth of diverse experience in all aspects of global operations. Prior to joining the team, he spent 10 years at Google in contract manufacturing, enterprise solutions, supply chain management and logistics execution. Prior to Google, Arroyo worked at Eaton's lighting division (now Signify) in various manufacturing, distribution fulfillment, and supply chain roles and holds a degree in Industrial Engineering from Auburn University.

"This is an exciting opportunity to step in as Waev's first COO and begin working with the team to quickly advance operational capabilities in support of our growing customers and markets – especially as electrification adoption reaches critical mass within the U.S. and around the world," said Arroyo. "Keith and I worked together earlier in my career and we've always managed to stay in touch. Things naturally connected after Keith reached out and presented the opportunity. I am impressed with what these guys have done at Waev – both the business they have built and equally the team culture they have created."

Arroyo

DoKaSch Names Visser Chief Commercial Officer

DoKaSch Temperature Solutions announces the appointment of Edwin Visser as new chief commercial officer. Visser is an experienced manager in the field of air freight, forwarding and temperature-controlled packaging solutions.

"As one of the few suppliers of active air freight containers, DoKaSch Temperature Solutions offers with the Opticooler a highly available and extremely reliable packaging solutions. I see many opportunities for Opticoolers in the global market and I am looking forward to further expanding the already strong network of DoKaSch TS with my extensive experience," says Visser.

"I am excited winning such an experienced industry executive for the team," says Andreas Seitz, DoKaSch TS managing director.

Visser

NEW DEALS

Swissport Adds Mombasa to its African Network

Swissport started operations at the airport of the coastal city of Mombasa, Kenya, at the end of December 2022. The services offered in Mombasa include passenger services and ramp handling, with the potential to expand to freighter handling. Swissport operates a large air cargo center at Nairobi International (NBO).

"We are thrilled to see Swissport expand from Nairobi to Mombasa's Moi International Airport," said Racheal Ndegwa, managing director of Swissport International in Kenya. "Our teams are well trained and can build on extensive experience from the Nairobi operation. Mombasa was a strategic and natural next step."

"Africa is a very important region for Swissport. We are intensifying our efforts to extend the network for our airline customers, both in countries where we already have a presence and at new airports," added Dirk Goovaerts, managing director for Continental Europe, Middle East and Africa, and global cargo chair. "Combining our global expertise with the knowledge and experience of our local teams, we are able to offer best-in-class and reliable aviation ground services for our airline customers in our growing network of airports around the world."

Moi International Airport in Mombasa is the second largest airport in Kenya and acts as an important gateway to many domestic and regional destinations.

Last year, Swissport Kenya celebrated its 25-year anniversary. The company

has been operating at Jomo Kenyatta International Airport since 1997. Swissport Kenya also offers centralized load control and cargo services for a growing number of international airlines. Nairobi is home to one of only two major load control centers Swissport operates.

Aviator Extends Contract with Turkish Airlines at Copenhagen Airport

Aviator Airport Alliance has strengthened their partnership with Turkish Airlines by extending a contract.

Under the extended partnership agreement, Aviator will provide Turkish Airlines with ground handling and deicing services at Copenhagen Airport. The contract will be in effect till the end of 2023.

"We are delighted to announce the continuation of our partnership with Turkish Airlines. Since we first began working together many years ago, we have been dedicated to providing exceptional ground handling and deicing services to the company," JensBo Hansen, Aviator airport partner managing director at Copenhagen Airport, said. "We are grateful for the opportunity to continue serving Turkish Airlines and look forward to building on our successful partnership in the future."

Menzies Aviation Partners with AGS Handling in Italy

Menzies Aviation and AGS Handling have formed a partnership to provide ground services at three airports in Italy – Bergamo Orio al Serio, Milan Malpensa and Verona Villafranca airports.

The Menzies AGS partnership has been awarded a contract to provide ground services to easyJet at Milan Malpensa Airport (MXP), the airline's busiest airport in Italy. The five-year contract, which starts in March 2023, will see the partnership provide passenger and ramp services to 24,500 easyJet flights per year.

"We're excited about the opportunity to expand our footprint with easyJet and support them at one of their key hubs in Europe. We look forward to delivering best in class service and solutions together with our partner AGS Handling, while also supporting our teams to reach their full potential by providing industry-leading training and development," Miguel Gomez-Sjunnesson, executive vice president Europe, Menzies Aviation said. "This latest win builds on our long-standing partnership with easyJet and means we will provide support to easyJet flights at their three largest hubs – Milan, London Gatwick and London Luton."

"Our partnership with Menzies is of important strategic value to our group. This agreement will allow us to expand our customer base and give further impetus to our strategic development plan in Italy and bring our People new opportunities for growth," Davide Mandaresu, general manager, AGS Handling, added.

Clearing the Runway for SAF in Asia Pacific

While the region is at an early stage in its use of sustainable aviation fuel and other decarbonization solutions, forecasts suggest 40 percent of global SAF demand will be coming from this area by 2050.

BY JAN TOSCHKA

If the world is to continue enjoying the benefits of flight, the sector must decarbonize. Pre-COVID-19, aviation produced around 1 billion tonnes of carbon emissions in 2019 – around 3 percent of the world's annual total.

And while the scale of the challenge is significant, at Shell our view is that the aviation sector can and needs to achieve net zero emissions by 2050. As such, I was particularly delighted to see ICAO and its member states adopt a net zero emissions target for 2050 at its assembly last October.

Reaching net zero will require a global effort, but I see the exact steps looking different in each market and taking place at different moments. This is a feature of the energy transition – it progresses at different paces in different places around the world.

From an aviation perspective, this is particularly visible in Asia Pacific – where the industry is set to be an engine for growth and prosperity in the region, particularly as we look beyond the pandemic.

Despite these forecasts, the region is at an early stage in its use of sustainable aviation fuel (SAF) and other decarbonization solutions. As I look at Asia Pacific today, I believe it's vital the industry works together to accelerate these efforts, especially the uptake of SAF – the most viable lever for decarbonization, certainly up to 2050.

Decarbonizing Asia Pacific Aviation

The International Air Transport Association (IATA) estimates that Asia Pacific will drive the biggest growth in global passenger numbers in the near-to-medium term, with more than half the total number of new passengers over the next 15 years predicted to come from this market.

To ensure this growth can be delivered in line with the industry's net zero ambitions, it will need to be accompanied by a significant increase in the use of decarbonization solutions.

According to forecasts by the Association of Asia Pacific Airlines, by 2050, 40 percent of global SAF demand – expected to be between 450 to 500 million tonnes – will be coming from the region.

But just as in other markets, there are challenges the region must overcome to scale SAF. The financial impact of the pandemic is still visible and will be for some time. Airlines also need to contend with the higher price point of SAF right now. This is where value chain collaboration is so important for making SAF the most viable option it can be for decarbonization.

It is this need for collaboration on SAF that led Shell, American Express Global Business Travel, Accenture and Energy Web Foundation to team up to create Avelia - one of the world's first blockchain-powered SAF book-and-claim platforms for business travel.

Avelia aims to aggregate corporate demand for SAF under one platform, share the cost of SAF among airlines and corporate travelers to make it more accessible financially, and secure NGO carbon accounting approval so airlines and businesses can use book-and-claim SAF solutions to claim emission reductions.

Thanks to its book-and-claim mechanism, Avelia would decouple SAF use from its geographic supply, making it easier for airlines and corporations to tap into global SAF supplies from wherever they are. This is an attractive proposition for airlines in the region.

More airlines based in Asia are publicly making commitments on the use of SAF to meet net zero emissions targets. This is something we've seen ourselves, having recently signed SAF MOUs with Japan Airlines, Korean Airlines and Cebu Pacific.

To deliver on this increase in demand, fuel suppliers and other players in the value chain must work together to supply SAF where needed.

There have been positive movements in the region. The Singapore government launched a set of feasibility studies to

SHELL AVIATION

SHELL AVIATION

While steps to increase the use of and improve access to SAF are essential, they must be complemented by significant and coordinated efforts to rapidly scale the production of SAF in the region too.

identify viable feedstock technology combinations for SAF production. Further progress took place when the Civil Aviation Authority of Singapore announced a value chain collaboration on demand, production and application of alternative fuels.

In September 2022, the Civil Aviation Authority of Singapore's International Advisory Panel in which Shell is a part of, published a report that put forth 15 practical pathways for how Singapore can decarbonize the aviation sector and become a sustainable air hub.

As set out in its Green Plan 2030, Singapore is taking up the mantel of sustainability leadership, seeking to make it a sustainable tourist destination. As part of that plan, Changi airport will play its part in becoming one of the first movers in the supply and trading of SAF for commercial aviation in the region.

Moving Beyond Production

To accelerate the region's decarbonization journey, we recognize that beyond the production of SAF, regional supply capabilities must be enhanced. One of the fundamental elements that must be addressed is developing the right infrastructure to ensure SAF can be supplied where airlines and airports need it.

Last year, Shell became the first supplier of SAF to the regional aviation hub of Singapore, helping airlines reduce aviation emissions. We have also completed the upgrading of our facilities in Singapore which enables the blending of neat SAF with jet fuel. A blending facility in the region enables a more efficient operation by moving neat SAF in bulk from production sources to the blending facility and then delivering blended SAF to where it is needed.

Building supply chain capabilities to blend, handle and distribute SAF is critical in enabling more customers across different segments access to SAF, as we saw last year with Shell supplying SAF to Cathay Pacific in Hong Kong International Airport, Japan Airlines and Cebu Pacific in Singapore Changi Airport, and Jet Aviation and Bombardier in Seletar Airport.

Working Across the Value Chain

While steps to increase the use of and improve access to SAF are essential, they must be complemented by significant and coordinated efforts to rapidly scale the production of SAF in the region too.

Today's commercial SAF production is only a fraction of total jet fuel consumption and SAF remains significantly more expensive than conventional jet fuel. Although new capacity is set to come online over the next five years, considerably more is required to achieve significant reductions in emissions. At Shell, we recognize the challenges of cost and scalability and are committed to working with wider industry and government to address them. To this end, I'm proud of our ambition to have at least 10 percent of global aviation fuel sales as SAF by 2030.

To deliver on this, we are working with partners as well as investing to create a step change in the volume of SAF available. A key part of this is transforming our existing refinery assets, including in Asia. In 2021, we announced plans for a biofuels facility, pending a final investment decision, at the Shell Energy and Chemicals Park Singapore.

The facility has the ability to produce 550,000 tonnes of low-carbon fuels a year, which means it is set to be one of Asia's largest biofuels facilities. It will help produce SAF, as well as renewable diesel for road transport and renewable chemicals.

Delivering on the Opportunity to Decarbonize

These are all important pieces of the aviation decarbonization puzzle that we are looking to solve in Asia Pacific – from ensuring the right SAF supply chain infrastructure is in place to looking ahead to producing SAF in the region.

But while individual steps like these are important, it is essential that they are underpinned by collaboration across the aviation value chain. Given how the energy transition is taking place at varying speeds across different regions, collaboration is critical in enabling progress.

There is a real opportunity to decarbonize aviation. And we're looking forward to working with customers and partners across Asia Pacific and beyond to accelerate aviation's pathway to net-zero emissions. **GSW**

ABOUT THE AUTHOR

JAN TOSCHKA

Jan Toschka is president of Shell Aviation. With one of the most extensive refueling networks in the world Shell Aviation supplies fuel, lubricants and sustainable solutions in more than 45 countries. Customers range from the world's largest airlines to private pilots. Toschka has been at Shell for 13 years, leading wholesale, retail, trading, marine and aviation businesses across the globe.

2023 State of the Industry

An examination of ground support trends as conveyed through Ground Support Worldwide's *annual survey.*

JOSH SMITH

During the final months of 2022, *Ground Support Worldwide* surveyed members of the industry, gathering firsthand feedback on various issues as they apply to ground support equipment (GSE) and ground handling personnel. More than 100 professionals contributed to the survey. Their input is reflected in the following pages as we examine the overall status of our industry.

Like in 2022, both finding and retaining staff as well as acquiring and maintaining equipment remained the top two challenges. However, those two issues swapped positions in our poll as nearly 50 percent of survey respondents identified staffing issues as a challenge for the industry.

"Everything we do basically revolves around labor. It makes a lot of sense that it's No. 1 on people's minds," says Rodrigo Yepes, Regional CEO, North and Central America at Grupo EULEN.

"It was probably a very, very critical issue I would say in Q4 of 2021 and the first half of 2022 because that's where the volume ramped up again back to pre-COVID levels, and we felt the strain," he adds. "I think it's still a very critical issue because even though many companies, like ourselves, have stabilized and have already achieved those pre-pandemic levels – both revenue-wise and staffing-wise. However, we did have to do a lot of things to get back to those levels and to stabilize our recruitment pipeline and getting people in the door."

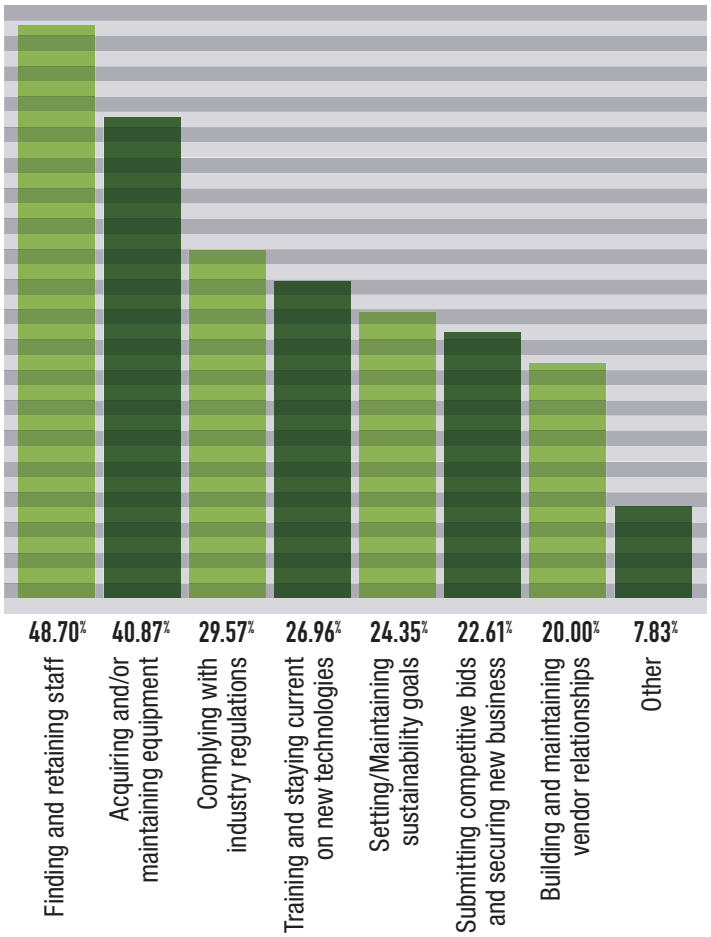
The increase in commercial airline traffic has created more business opportunities for more than half of those surveyed.

Acquiring and maintaining equipment also remains a challenge to businesses, leading to strains on company budgets. Approximately two-thirds of the industry personnel surveyed noted supply chain bottlenecks have had an impact on their business.

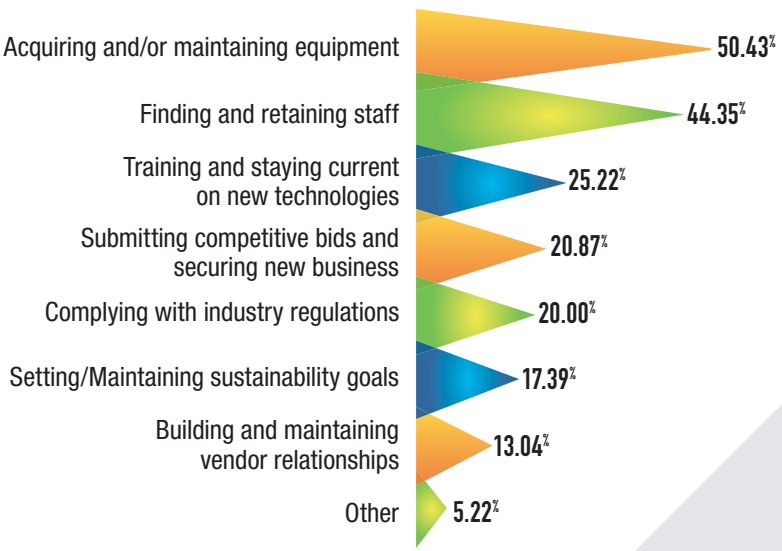
"Every industry, and the whole economy, went through that supply chain strain," Yepes says.

However, he adds, ground handling has unique challenges. Yepes notes that retail businesses may have a broad spectrum of vendors and suppliers. But for ground handlers, that number of vendors is much lower.

What are the greatest challenges to your business?



What factors put the biggest strain on your company's budget?



How has commercial air travel's ramp-up impacted your business?

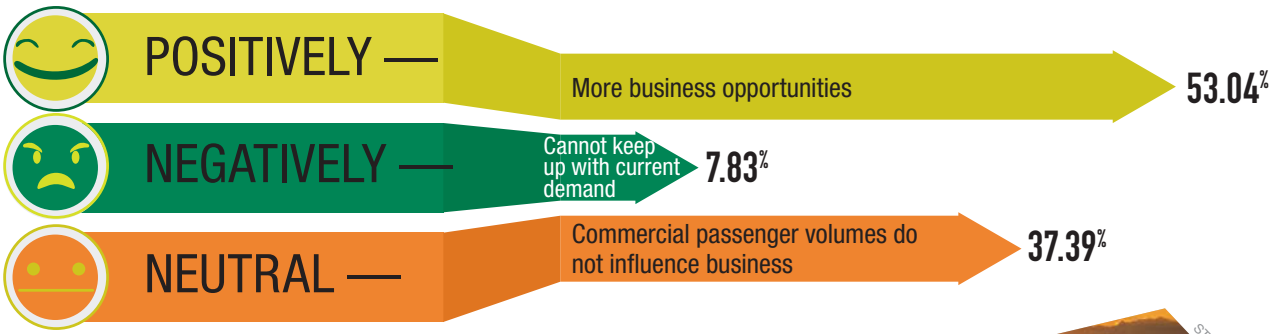


PHOTO 26176283 © MYKYTA STARYCHENKO / DREAMSTIME.COM

What measures is your company taking to reduce costs in 2023?

There are no budget reduction plans **42.61%**

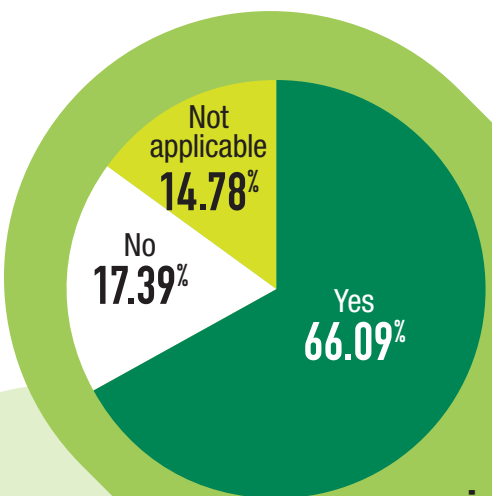
Overall budget reduction **35.65%**

Reducing parts & maintenance expenses **25.22%**

Implementing reductions in force (Permanent termination of employment) **10.43%**

Suspending contracted services **8.70%**

Other **5.22%**



Have supply chain bottle-necks impacted your business?

Staffing levels in the industry are rising. While last year, 34 percent of respondents had increased staff, this year's survey showed nearly half of our respondents had increased their staff. Along with that trend, the number of companies that decreased staff went from 32 percent to approximately 22 percent.

"I'm actually a little bit surprised that 'increased' was only 50 percent," Yepes says. "If we follow just the overall aviation trends, from the airlines, the bulk of the recovery in the industry was the first semester of 2022. I would say that's when everything spiked."

The spike in hiring is reflected in our survey as 30 percent of survey participants indicated they hired 50 or more employees in the last year.

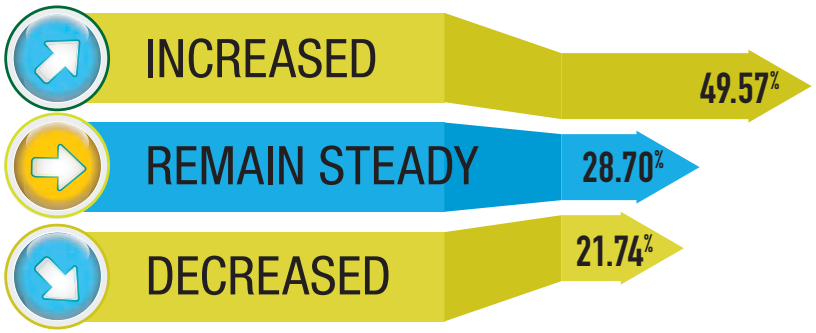
"Everyone was looking to hire larger numbers than before. The airlines are also looking into hiring. Working at airports, you need the security badges at different levels of clearance," Yepes says. "It's a prized commodity to find an employee with a badge, and everyone is going after them."

Some companies may have been overstaffed throughout 2021 as several government incentives to retain employees and payroll were available. It is possible that the 29 percent of companies that kept staffing level fit into this category. Yepes notes that with pre-pandemic levels being achieved by many across the industry, this future growth may level off.

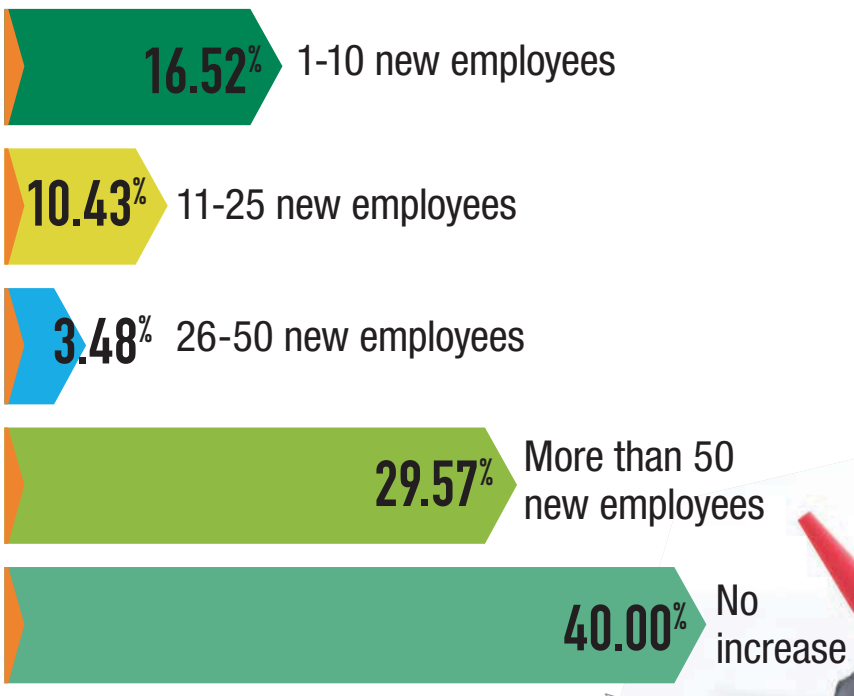
Given the nature of the ground support industry, safety remains a top priority for those surveyed.

More than 80 percent of respondents have a safety management system (SMS) in place. An SMS is required for ground service providers

In the past year, has your company's staff:



In the past year, how many employees have you hired?



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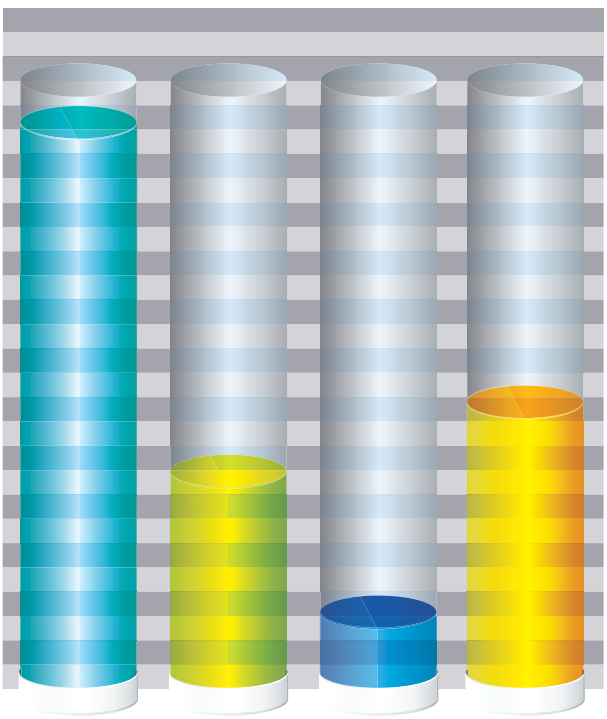
to achieve IATA Safety Audit of Ground Operations (ISAGO) registration and for FBOs to earn International Standard for Business Aircraft Handling (IS-BAH) certification.

"It's going to become evermore present, if it already isn't, in every airport for you to have some sort of certification to be able to operate based on an overall SMS," Yepes says.

There appears to be a strong correlation between SMS adoption and workplace safety as approximately 90 percent of those surveyed reported 10 or fewer workplace accidents in the past year.

How many workplace accidents have occurred at your company in the past year?



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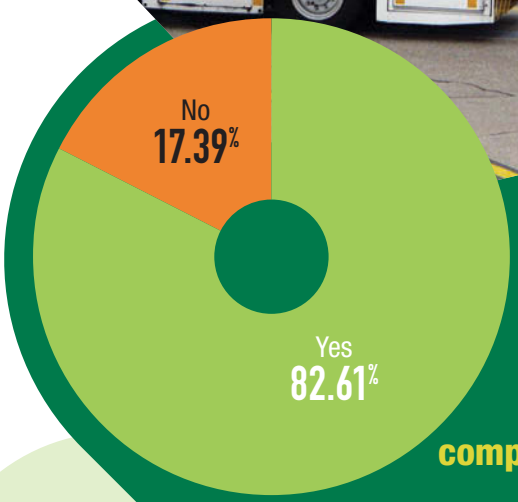


Does your company have a safety management system (SMS) in place?

New ground support equipment is entering the market, as this year's survey saw a slight rise in equipment aged 0-4 years and a slight decrease in equipment older than 20 years. But the vast majority of equipment is between 5 and 19 years old, which is similar to the results of the 2022 State of the Industry survey.

However, we could see more equipment purchases in 2023 as nearly 90 percent of those surveyed indicated their budget would increase or remain the same this year – more than half indicated their budgets will increase.

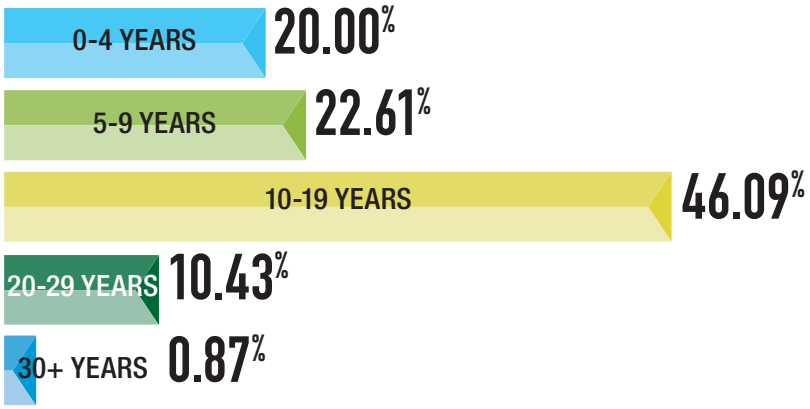
It is possible that improved supply chain conditions could increase the amount of new GSE in the field this year. As supply chain bottlenecks had an increasingly larger effect on the industry, some GSE customers utilized the secondary market and deployed more used GSE into operations.

More than 80 percent of those surveyed are using diesel-powered GSE in their operations – 27 percent of which are using exclusively diesel-powered equipment.

This number seems to indicate that the industry's larger trend to electrify GSE will require time to take effect.

However, 13 percent of our survey's respondents stated their GSE fleets were comprised of a majority of electric ground support equipment. Another 3.48 percent stated their fleets are comprised entirely of electric GSE.

What is the average age of equipment in your GSE fleet?



What is your GSE fleet comprised of?

All diesel- / gasoline-powered equipment
26.96%

A majority of diesel- / gasoline-powered equipment
54.78%

A majority of electric-powered GSE
13.04%

All electric GSE
3.48%

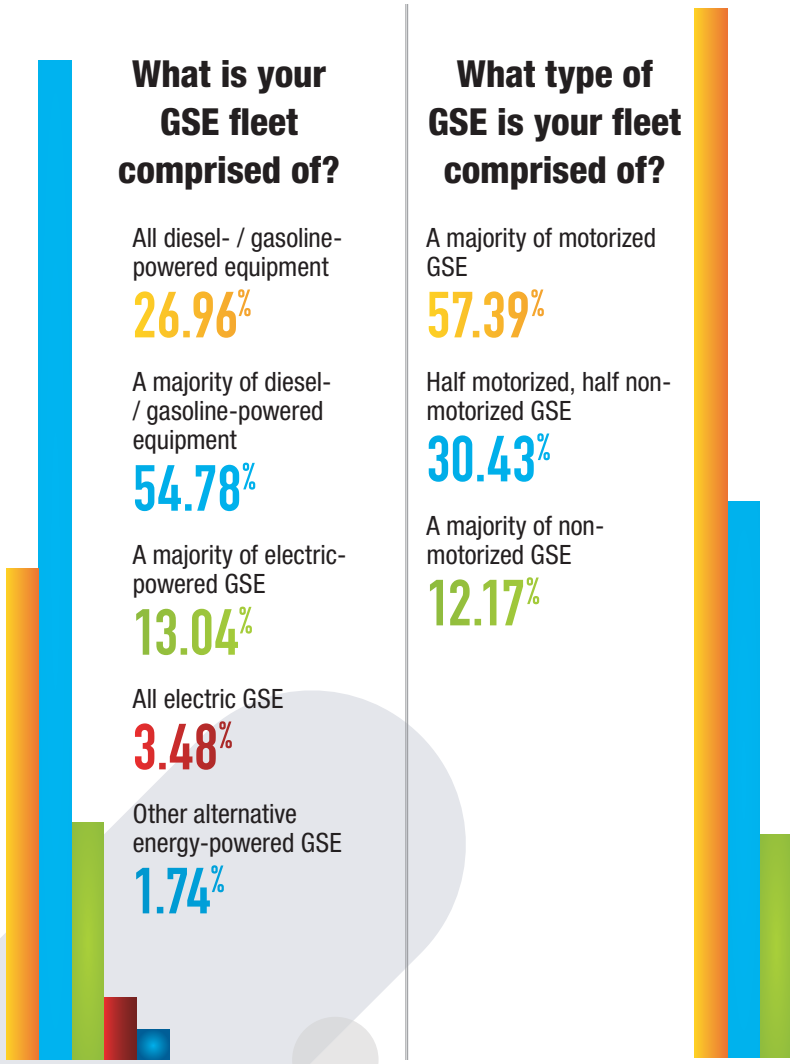
Other alternative energy-powered GSE
1.74%

What type of GSE is your fleet comprised of?

A majority of motorized GSE
57.39%

Half motorized, half non-motorized GSE
30.43%

A majority of non-motorized GSE
12.17%



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How do you finance the equipment in your GSE fleet?

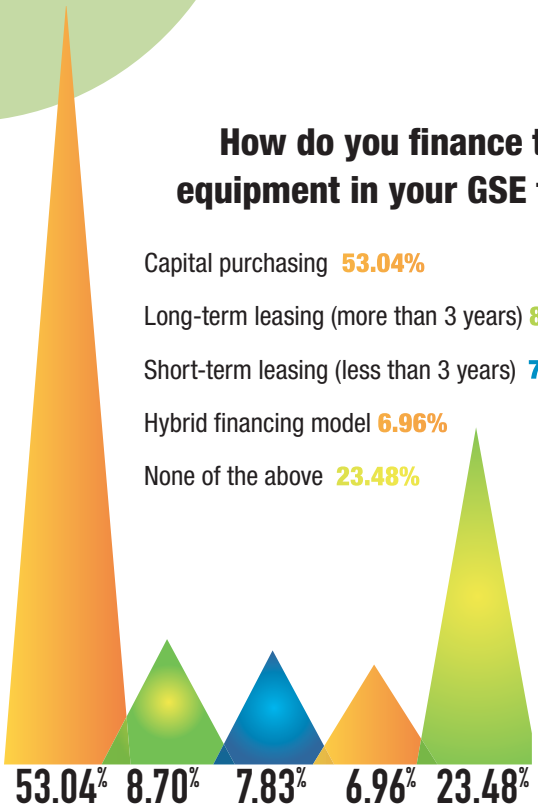
Capital purchasing **53.04%**

Long-term leasing (more than 3 years) **8.70%**

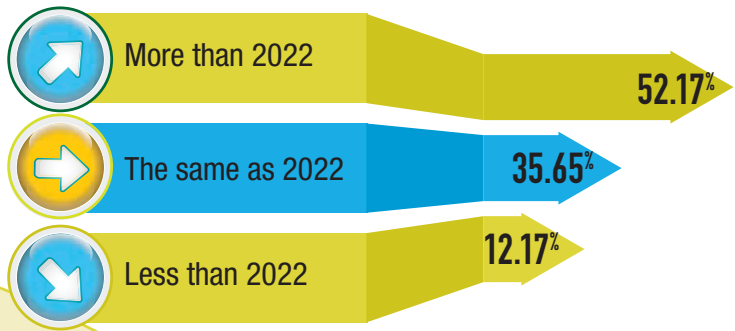
Short-term leasing (less than 3 years) **7.83%**

Hybrid financing model **6.96%**

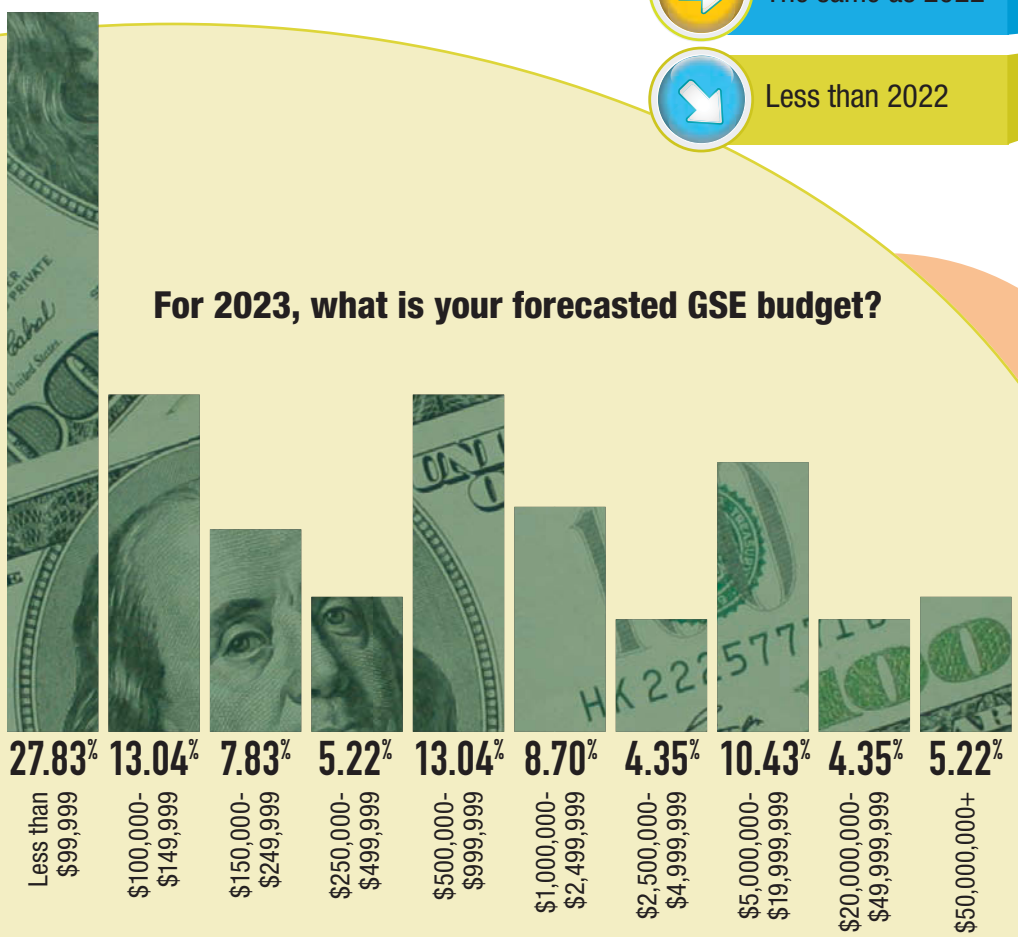
None of the above **23.48%**



Do you anticipate your 2023 GSE budget will be:



For 2023, what is your forecasted GSE budget?



At the end of 2022, IATA called on the industry to adopt the use of enhanced GSE. The association reasoned increased technology, like anti-collision solutions, can improve safety and mitigate costs associated with ground damage.

"Transitioning to enhanced GSE with anti-collision technology is a no-brainer. We have proven technology that can improve safety. And with the cost of ground damage growing across the industry, there is a clear business case supporting early adoption. The challenge now is to put together a roadmap so that all stakeholders are aligned on a transition plan," Nick Careen, IATA SVP operations, safety and security, said in a release that announced the association's call for enhanced GSE.

Of those we surveyed, 30 percent indicated they currently use GSE with anti-collision technology.

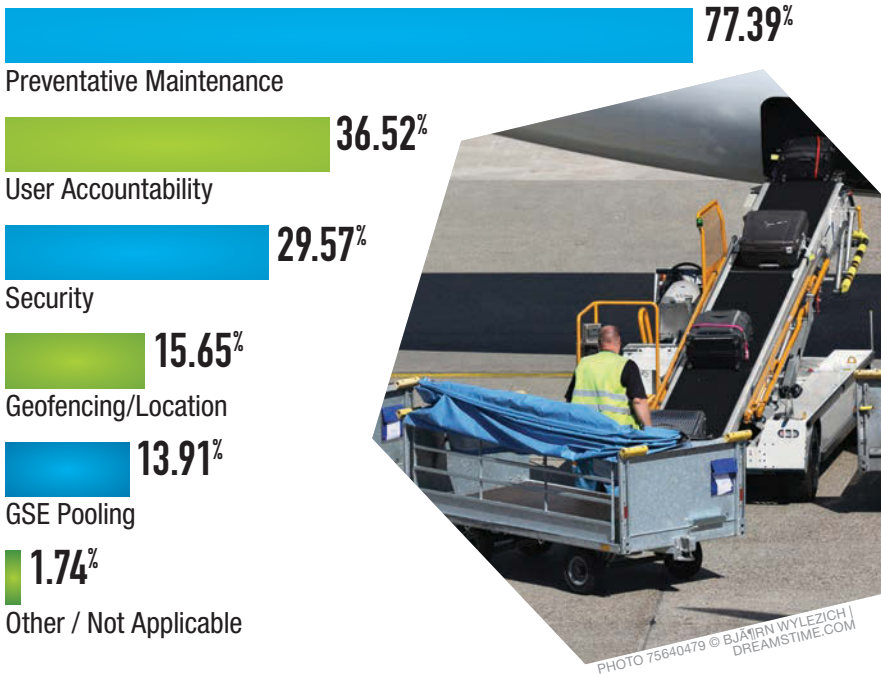
Adoption of technology solutions continues to grow in the industry. However the range of technology currently in use varies greatly based on our survey results.

Hesitancy to adopt new technology boils down to time and money.

"The financial piece does play a lot into the equation because most of the technology that's available out there for ground handling companies is relatively new. Because it's relatively new, it's still more expensive than what you have for other industries," Yepes says.

"In an industry that's, in general, very labor intensive and labor costs are very expensive, then when you add in that other component, it might drive you up," he adds. "In general, it's very good practice to implement them."

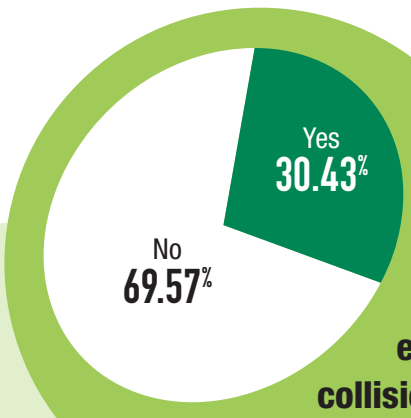
Which asset management functions does your company currently utilize?



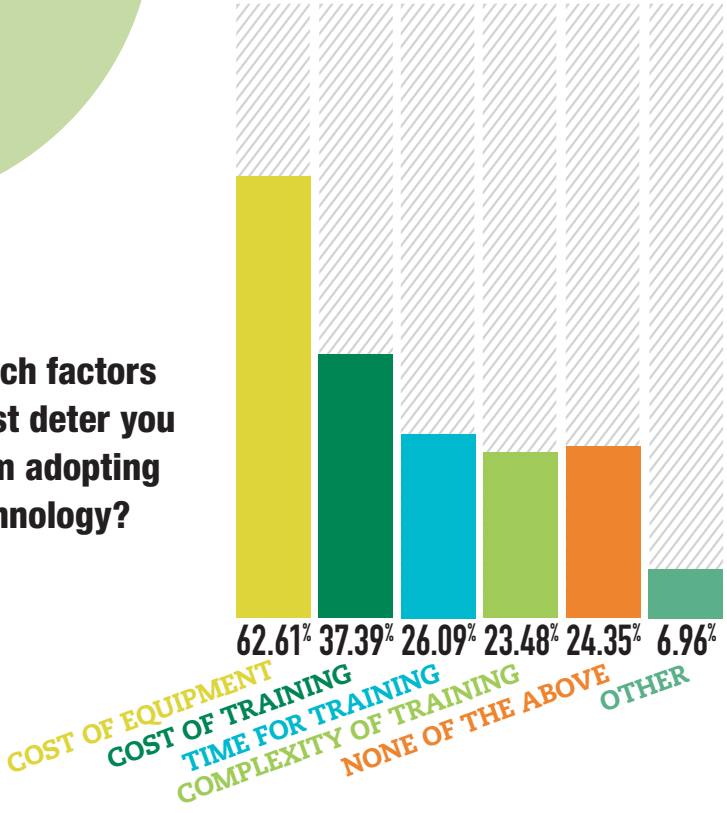
Which of the following types of technology does your company utilize?

Personal/ Handheld Devices	74.78%	Internet of Things (IoT) Platforms	18.26%
Mobile Apps	53.04%	Artificial Intelligence	8.70%
Cloud-based Services	34.78%	Autonomous/ Robotic Equipment	6.96%
Bluetooth Connected Equipment	24.35%	Virtual/Augmented Reality	1.74%
Automated Solutions	20.87%	Other	3.48%

Does your company currently operate GSE equipped with collision-avoidance technology?



Which factors most deter you from adopting technology?



The industry may not be fully recovered from the impacts of the COVID-19 pandemic. But the growth across all of aviation indicates many of the pandemic's effects are waning.

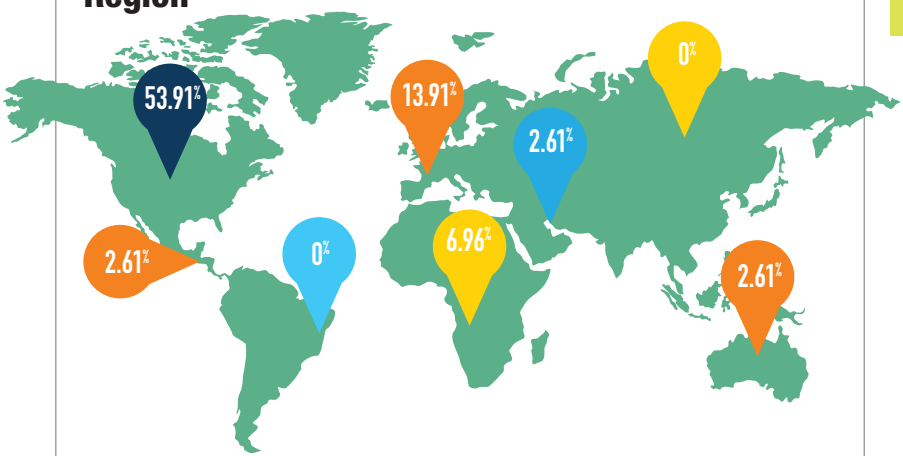
IATA reported that total traffic in November of 2022 rose 41.3 percent compared to November figures from 2021. What's more, the association reported global traffic was at 75.3 percent of levels from November 2019.

"A very general trend that's going to come is, let's label it, stability," Yepes says. "The numbers that we saw in late 2021 and 2022, passenger continuing to fly everywhere any time, there's really no off-season.

"I think the aviation industry is going to pull through whatever comes the next few months and continue to grow," he continues. "We're going to have to be there to accompany that growth." **GSW**

SURVEY DEMOGRAPHICS

Region



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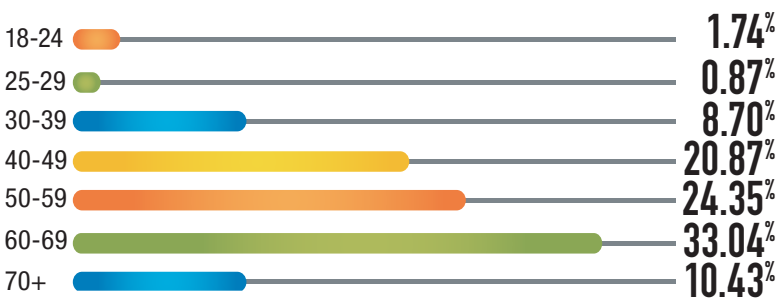

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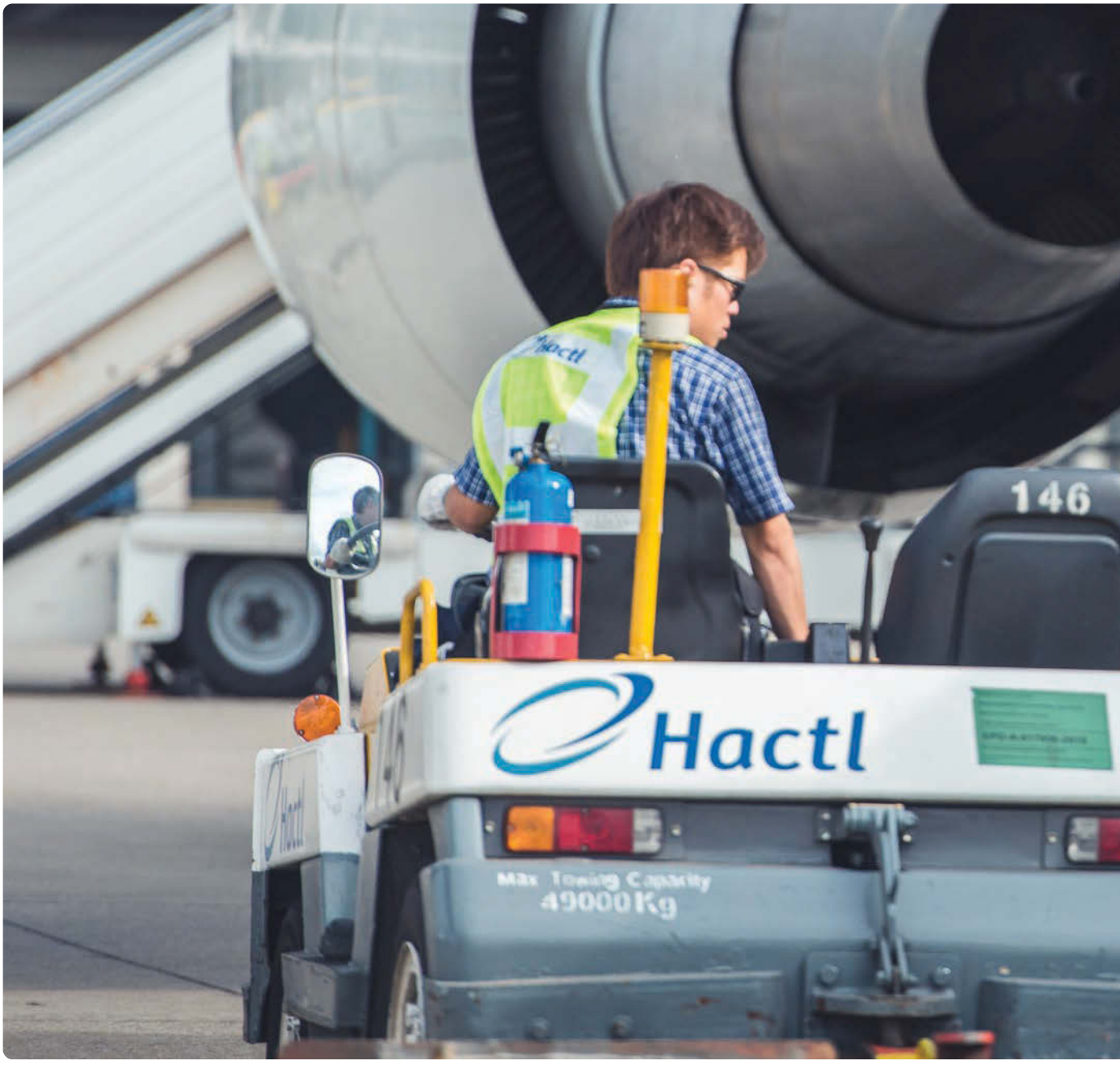
Safety Standards for Shipping Lithium Batteries

IATA's CEIV Lithium Batteries certification program is designed to enable transport, meet safety obligations and comply with applicable regulations.

BY MARIO PIEROBON



It is well known that lithium batteries are now used to power a wide variety of consumer goods, ranging from mobile phones to children's toys as well as cars and e-bikes. In the air cargo business, there are some peculiarities for the safe transfer of lithium batteries.

To safely execute the transport of these goods, members of the industry have adopted the International Air Transport Association's (IATA) Center of Excellence for Independent Validators (CEIV) Lithium Batteries certification program.

HACTL

CEIV Li-batt entails detailed documentation of all procedures, and then external auditing of these processes and all facilities by IATA to ensure they are totally compliant.

Accreditation System

Though widely used, most people are not aware that lithium batteries are dangerous goods that can pose a safety risk if not prepared in accordance with transport regulations, affirms Yaniv Sorany, senior manager of certifications at IATA.

"CEIV Lithium Batteries (Li-batt) is a certification program designed by IATA to enable the supply chain of lithium battery products such as shippers, freight forwarders, cargo handling facilities and airlines to meet their safety obligations by complying with the applicable transport regulations," he says.

Lithium batteries are becoming the preferred energy source for consumer electronics and mobility products, notes Bob Chi, CEO of gateway services at SATS.

"For us as an air cargo handler, such growth brings business opportunities as well as the need for robust risk management. Safety, which is a top priority for the industry, has become even more important. Lithium battery shipments from improperly packed items to mislabeled packages, can pose a safety risk to aircraft, passengers and crew members," he says. "We are proud to be the first ground handler in the world to receive the IATA CEIV Li-batt accreditation, which is a reflection of the care and diligence we accord while handling shipments of dangerous goods."

Indeed, according to Wilson Kwong, chief executive of Hactl, lithium batteries are becoming an increasingly prevalent commodity within air cargo.

"The risks arise mainly from mishandling, as severe impacts have been known to cause fires. Therefore, a rigid and comprehensive procedural regime is essential to ensure safety on the ground and in the air," he says. "IATA is best placed to devise and implement the necessary standards, firstly because it works closely with all the major carriers and understands all aspects of aviation safety and practicality, and secondly because any IATA initiative immediately benefits from critical mass that facilitates uniformity.

"It is better to have a single, uniform standard with which everyone agrees and complies. As an accredited provider, Hactl can provide full impartial assurance to its customer airlines that the ground handling aspects of their carriage of lithium batteries is legal and safe," Kwong adds.

Accreditation Process

Concerning the accreditation process, Sorany explains that the program is based on the IATA Dangerous Goods Regulations (DGR) and the IATA Lithium Battery Shipping Regulations (LBSR).

To achieve the certification, Sorany says companies shall ensure that their personnel will successfully complete the Lithium Batteries Logistics Safety Management training to demonstrate that they have the knowledge and skills to transport lithium batteries, followed by an assessment and validation audits conducted by independent validators of the company system, process, documentations and operations to determine compliance of the organization with the criteria set forth in the CEIV Lithium Batteries audit checklist and continuance improvements.

Like with all CEIV accreditations, CEIV Li-batt entails detailed documentation of all procedures, and then external auditing of these processes and all facilities by IATA to ensure they are totally compliant with the IATA handling procedures relating to lithium batteries in particular and hazardous cargo in general, explains Kwong.

"Given that Hactl was already experienced in this area, and it operates its own IATA-accredited in-house training center for DGR cargo, the process of preparing for application through to receiving accreditation was quite straightforward," he says.

At SATS, their air cargo handling and dangerous goods operations were subjected to the CEIV Li-batt certification process over three months and in five phases, and specifically, preparation, training, assessment, validation and certification, affirms Chi.

"The assessment and independent validation process determined our compliance to over 300 items in an audit checklist, which required us to provide documentation and furnish evidence of implementation," he says.

Competency and Quality Management

One of the stated targets of CEIV Lithium Batteries is improving competency and quality management in the handling and carriage of lithium batteries. Kwong highlights that this refers to the benefits of CEIV Li-batt accreditation: the assurance that training is current, regular and comprehensive, resulting in a properly qualified workforce, and that all necessary mechanisms are in place to monitor and log handling performance, and identify and remedy any potential shortcomings.

As to the implications of the competency and quality management target, Sorany affirms that the aviation industry has voiced concerns over the lack of awareness and the increasing number of incidents related to mis-declared and non-compliant lithium batteries in cargo shipments, and the need to address the safety risks to ensure that the safety of the supply chain is not compromised.

"The CEIV Lithium Batteries certification establishes baseline standards to improve the level of competency of personnel involved in the handling and transport of lithium batteries who must successfully complete the Lithium Batteries Logistics Safety Management training as part of the certification process," he says.

"As a next step, companies undergo an assessment of the handling and transport of lithium batteries against the dedicated CEIV Li-batt audit checklist to ensure compliance with program's standards, including a gap analysis if applicable and a detailed list of specific areas of improvement aiming to improve the quality management in the handling and carriage of lithium battery products throughout the supply chain," says Sorany.

Chi observes that, as part of the accreditation process, SATS sent the key personnel across its network of operations to attend the IATA CEIV Li-batt Safety Management course.

"This was done to enhance skills and knowledge in handling lithium batteries, including the detection of

IATA

undeclared/hidden lithium batteries shipped as general cargo. Establishing standardized and efficient processes also improves out capability to deliver quality service performance and helps us drive consistency, safety and operational excellence," he says.

Future Updates

According to Sorany, CEIV Lithium Batteries program standards are updated continuously to align with the provisions of the IATA Dangerous Goods Regulations and the IATA Lithium Battery Shipping Regulations.

"Moreover, IATA called on governments to further support the safe carriage of lithium batteries by developing and implementing global standards for screening, fire-testing and incident information sharing. These measures would support significant initiatives by airlines, shippers and manufacturers to ensure lithium batteries can be carried safely," he says.

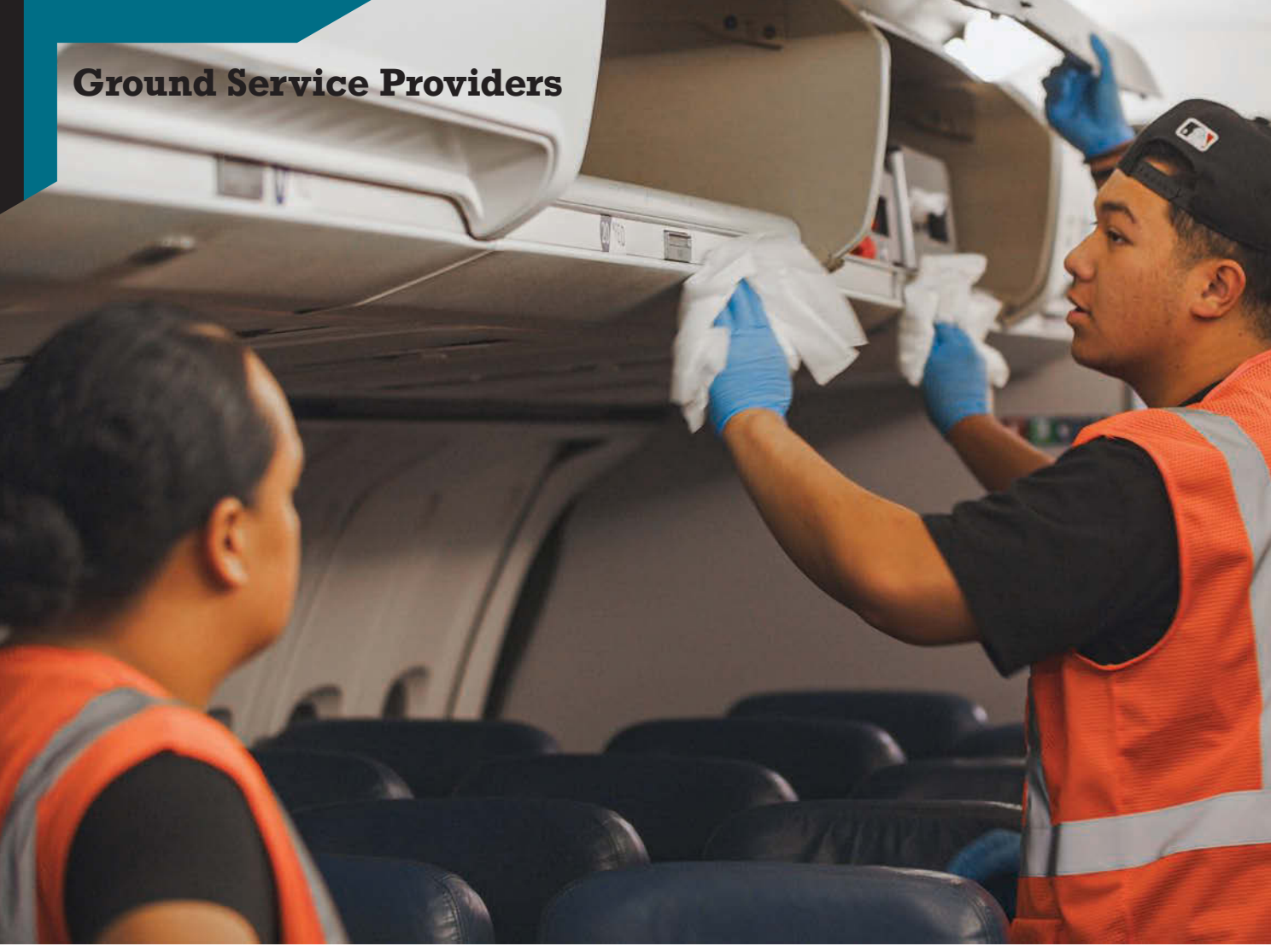
Reflecting the dynamic nature of the domain of dangerous goods, additional IATA actions to date have included updates to the dangerous goods regulations and the development of supplementary guidance material, the launch of a dangerous goods occurrence reporting alert system that provides a mechanism for airlines to share information on events involving undeclared or mis-declared dangerous goods, concludes Sorany. **GSW**

ABOUT THE AUTHOR

DR. MARIO PIEROBON

Dr. Mario Pierobon provides solutions in the areas of documentation, training and consulting to organizations operating in safety-sensitive industries.

He has conducted a doctoral research project investigating aircraft ground handling safety. He may be reached at mariopierobon@az-all-in-one.com.



Tips for Turnaround Cleans

A ground handling veteran shares thoughts on how cabin cleaners can do their part to help airlines avoid delays.

BY REBECCA KANABLE

Delayed aircraft cost airlines and passengers billions of dollars each year. Airlines for America (A4A) says those costs are in addition to other expenses created by the need for extra gates and ground personnel as well as costs imposed on airline passengers. Altogether, the Federal Aviation Administration's (FAA) National Center of Excellence for Aviation Operations Research (NEXTOR) estimated the annual costs of delays (direct cost to airlines and passengers, lost demand and indirect costs) in 2018 to be $28 billion.

Throughout 2022 and the start of 2023, airline cancellations and delays were in the news, and airlines were under scrutiny – and, in some cases, under federal investigation.

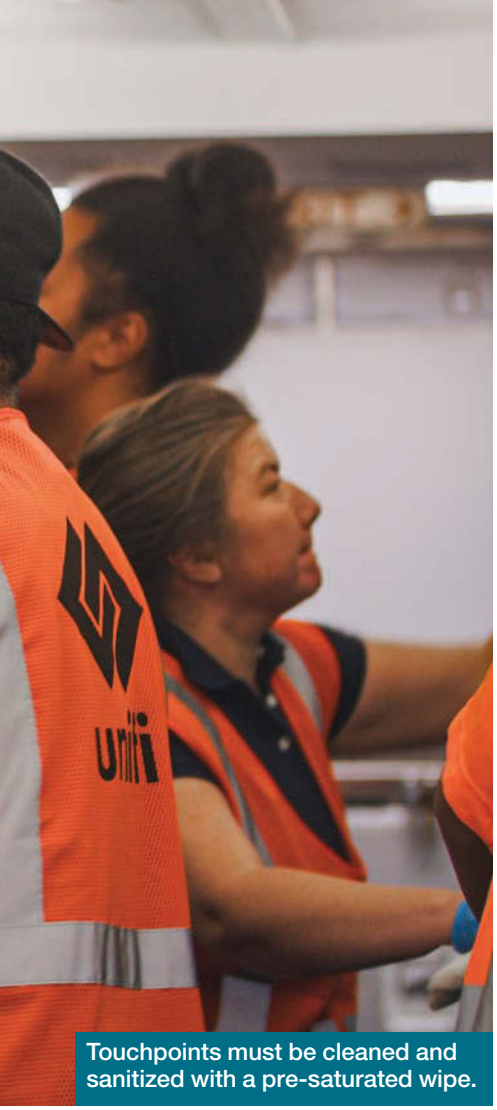
Of course, cancellations and delays aren't always in an airline's control. The Aviation System Performance Metrics (ASPM) online access system records minutes of delay for five possible causes of flight arrival delays: airline carrier, weather, National Aviation System (NAS), security and late arrival. Causes of a cancellation or delay due to circumstances that are considered within the airline's control include aircraft cleaning, baggage loading and fueling.

Ground handlers, including cabin cleaners, play a significant role in helping airlines ensure that a flight leaves on schedule. Josh Kennedy, senior vice president of operations at Unifi, began his career in the industry as a cabin cleaner and has been involved in cabin cleaning in one way or another for about 17 years. Kennedy says following key processes during cabin cleaning is critical in order to get the job done efficiently and effectively.

"Process-wise, time is of the essence," he says.

"Turnaround cleans definitely require ample manpower to get in there and clean the aircraft," Kennedy adds.

Baseline teams are made up of four, eight or 12 people. A team of four would be ideal for a regional jet, but teams can get make do with three.



UNIFI

Touchpoints must be cleaned and sanitized with a pre-saturated wipe.

"Everything's dictated by man minutes, or minutes that are required to clean a plane," he says. "So if a plane is on the ground for a couple of hours, then obviously you can send less folks from the team up to get the job done."

Time on the aircraft, based on size of the plane and time available to clean, is determined by the airlines.

If the aircraft is a 737 with normal ground time, Kennedy says eight people would be assigned. If that time was compressed because the flight was arriving late, he says 10 people might be tasked with the turnaround clean. During quick turnarounds on a 737, Kennedy says there is not much room to move, so using more than 10 people could be counterproductive.

"There are set teams so you can kind of plug and play different teams over as they're dispatched to different aircraft to help out," he says.

At larger hubs, jobs can be more specialized. Aircraft cabin cleaners will focus only on cabin cleaning. At smaller locations, where an airline might have just a couple of flights per day, multi-tasking is more common. Ground handlers that are loading the bags or gate agents will also assist with cleaning.

"Everyone is kind of all-hands-on-deck in the smallest locations, but at hubs, larger airports, there are definitely dedicated cabin cleaners," Kennedy says.

Typically, Kennedy says someone who is a cabin cleaner for Unifi will be trained in all areas (galley cleaning, lavatory cleaning, first class seats, coach seats), but there may be a time where an employee only knows one or two of those areas and that is where they will focus.

At the beginning of a shift, employees are assigned to a specific area to clean, and a team leader is designated.

"If the aircraft is on the ground for a minimum ground time – it's delayed and then you got to allow time for loading and off-loading of passengers, you could be done in 6 to 10 minutes," he says, adding that's the shortest timeframe for cabin cleaning to be conducted.

For a normal turn clean, he says 15 to 25 minutes is a normal turnaround clean time on a narrow-body aircraft.

While each airline has different specifics, the overall process is very similar. Post-pandemic, Kennedy says turnarounds still require a more detailed cleaning than what was done in the past prior to COVID. Sanitizing all the touchpoints wasn't normally done on every turn.

"That was always done on a daily basis for sure, in the past, but now it's done on every turn," he says.

Touchpoints include the tray tables, armrests, window shades, air vents, reading light switches, flight attendant call button and the handles on overhead bins.

"Those are all wiped down with a rag and sanitized in a quick fashion," he says.

When Kennedy is out with the cleaning teams, he tells them that their job is one of the hardest.

"Cabin cleaning doesn't get the celebration as other areas of aviation does and it's not easy. It's a physically demanding job, and that time compression makes it even that much more physical," he says, adding that's why it is key to ensure the proper amount of staffing.

Turnaround Cleaning Goals

The goals for turnaround cleans are multiple.

Goal No. 1, Kennedy says, is ensuring that the employees aren't hurting themselves on the aircraft, which can happen when the proper personal protective equipment (PPE) is not worn.

"Safety is obviously a No. 1 goal for us any time we jump on an aircraft to clean," he says.

Goals 2 and 3 he says are "making sure that we hit all targets, performing the clean properly as well as in a timely fashion. They go hand in hand."

If a cabin isn't cleaned properly, cabin cleaners might be called back to finish the job or address certain areas that were not done properly. That could delay the aircraft another 10 or 20 minutes.

Sometimes more time for a turn clean is necessary.

"When someone has been sick on the aircraft, and you have to bring out the biohazards kits to clean, that would take an additional PPE requirement, getting another kit to bring on board to ensure that we sanitize properly that area, as well as the surrounding areas," Kennedy says. "When a passenger has been sick on the aircraft, that takes the time out to really, stop, make sure we got everything brought up from a biohazard standpoint and go about the cleaning cautiously from there.

"You have to do it properly. Take the delay. That's a good delay or good safety time out obviously to make sure it's cleaned properly."

Other types of cleaning include overnight cleaning, which is a more detailed process that occurs nightly for an hour or more, and deep cleaning, which occurs every 30 to 45 days and requires six to eight hours.

For turn cleans, specifically, Kennedy offers several tips.

- **Before cleaning –** Preparation is key to saving time at the beginning of the clean. When you're not prepared, it can take an extra five minutes-plus to get organized. If you're cleaning the lavatories, you have a lavatory kit or cleaning bag with all the proper tools. Preparing beforehand wherever

chemicals and supplies are necessary is key.

- **PPE —** Gloves are required 100 percent of the time, regardless of position. Changing gloves or even wearing double gloves may be necessary to ensure the hands are protected. Some cleaners opt to wear masks. It's not required but gloves are definitely the most important PPE that cabin cleaners use on a per clean basis.
- **Training –** According to Kennedy, Unifi has a mockup of a cabin with aircraft seats in some markets to assist with training. Getting on aircraft, allowing employees to physically get a feel for the cleaning as they go throughout the process is important because the physical demand of getting in between the different rows can be difficult. Being able to bring on new hires and show videos to new hires who may have never been on an aircraft or flown is key just to get their mind focused on what the job entails. So the training provided by a physical mockup after classroom training is completed helps complement on-the-job training.
- **Checklists –** Checklists from a lead's perspective provide oversight on assignments. Flowing through a checklist, and then a separate checklist for a team lead, who then goes through the aircraft to do a final inspection with their checklist, is very helpful.
- **Color-codes –** Some airlines color-code supplies – one color for galley supplies, one for lavs, one for cabins, etc. From a visibility standpoint, if someone was auditing or someone came on board, they can clearly see that color and ensure that there's no cross contamination between the different areas, which is very important. Kits are built on an airline's requirements.
- **Ensuring a proper clean –** This task falls to team leaders. The leads go through checklists and do a walk through of the aircraft after the team has cleaned.

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The number of cabin cleaners on a cleaning team depends on the size of the aircraft and the time available to get the cleaning done.

The Importance of Cabin Cleaners

Kennedy says cabin cleaning staff do not have high visibility or receive recognition from flying customers because the job is done behind the scenes.

"It's crucial for us as a company and a leadership team to really thank them on a daily basis but more so celebrate wins from audits. The airlines and ourselves, we do internal audits on the teams, and the airlines do audits and really put together a scoring competition between the groups on grading those cleans," he says. "Celebrating with the teams on those wins to really recognize the folks for the hard work they've done is crucial to creating a great culture."

Kennedy adds it's important to emphasize how much cleaning tasks matter.

"It's a thankless job," he says. "They don't get to see it, but knowing if that passenger was sitting on an aircraft for three-plus hours in an area that they may not have cleaned and paid lots of money to sit there, they wouldn't be very happy.

"Passengers want a clean product and our employees carry so much weight of making sure that happens, so it's a very important job and we have some great folks out there doing it." **GSW**

Accurate situational awareness requires the right tools to effectively assess storms, visibility, wind, precipitation, freezing conditions, runway surfaces and more.

Optimize Airport Efficiency and Safety When Winter Weather Strikes

Building situational awareness into your winter weather plans minimizes downtime when storms hit.

BY KARI LUUKKONEN

No matter where an airport is located, severe weather conditions can complicate how decision-makers maintain the safety and efficiency of its logistics and operations. And for many, the colder months bring especially unique challenges having to contend with winter weather, as one blizzard or ice storm can cause a chain reaction wreaking havoc across the globe.

These severe weather events create potentially hazardous conditions that cause cost-prohibitive, inconvenient delays and put lives at risk. According to the Federal Aviation Administration, inclement weather conditions are the most significant cause of flight delays making up nearly 70 percent of all delays exceeding 15 minutes in an average year. What's more, is the safety factor. While human error is the most common cause of accidents, the weather is a primary contributing factor in nearly 25 percent of all aviation accidents.

This is why accurate situational awareness is critical to airports and requires the right tools to effectively assess storms, visibility, wind, precipitation, freezing conditions, runway surfaces and more. When it comes to winter weather, the best aviation weather management systems incorporate a wide range of sensors to produce the most valuable real-time reports and alerts.

Unfortunately, conventional present weather sensors don't always deliver the necessary information aviation industry decision-makers need to make more accurate weather predictions and reduce costly delays. A significant number of amendments to meteorological terminal

air reports (METARs) are due to false present weather information. This is typically due to three primary issues:

- **Detection:** Missed weather events due to insufficient detection sensitivity.
- **Identification:** Inadequate precipitation identification performance due to a lack of high-quality raw data and unoptimized identification algorithms.
- **Field Performance:** Increased operational measurement disturbances caused by suboptimal product design and lack of contamination compensation.

Fortunately, by integrating the latest real-time weather and system algorithms with accurate weather observations and reporting, innovative aviation weather management solutions enable comprehensive situational awareness of the weather within and above airport boundaries. Empowered with such solutions, decision-makers can improve the effectiveness and timeliness of weather impact mitigation plans and help pilots avoid or take precautionary measures in inclement conditions. These solutions better maintain safe, efficient operations and minimize downtime when severe weather strikes, most notably with freezing conditions, low visibility and wind.

Staying Ahead of Freezing Conditions

When temperatures plummet, and precipitation falls from the sky, freezing conditions complicate daily operations and require extra time and manpower to ensure safe travel. In addition to causing costly delays and cancellations, extreme cold forces decision-makers to deice and anti-ice aircraft and ameliorate the impact of freezing conditions on runways and taxiways. Unfortunately, the deicing and anti-icing processes can have a significant impact on resources. Not only are the fluids used costly, but queuing planes for these processes can further delay operations.

While nature cannot be controlled, weather radars can deliver precise meteorological information for an area, tracking and nowcasting the location of severe storms. By providing advanced warning of a broad range of approaching weather phenomena, including wind shear, precipitation (type and amount), thunderstorms, microbursts and more, weather radar enables good situational awareness and helps improve safety and airport efficiency since planes can be directed to avoid inclement weather conditions.

In addition, more advanced tools are available to help mitigate the impact of freezing conditions in winter weather,

VAISALA

According to the FAA, inclement weather conditions make up nearly 70% of all delays exceeding 15 minutes in an average year.

VAISALA

specifically advanced lidar ceilometer technology.

While ceilometers have been an essential part of basic weather instrumentation at airports for many years for the information they provide about cloud height — especially safety-critical, low-altitude clouds — as well as vertical visibility and cloud coverage, new ceilometers on the market go beyond standard cloud height reporting.

Novel lidar ceilometers with depolarization capabilities enable the detection of icing conditions, volcanic ash and sand/dust layers aloft. This provides a much deeper understanding of what is happening in the atmosphere immediately above the airport or in the surrounding area.

Designed for unattended operations, these ceilometers provide cloud height measurements thanks to new depolarization technology. Depolarization can clearly differentiate between solid and liquid particles to help detect essential phenomena that can impact aviation safety and efficiency. With these measurements, decision-makers can notify aircraft how they could be impacted and enable airport operators to take necessary action.

With severe icing conditions serving as a significant weather hazard for aviation, this technology has been beneficial in addressing icing conditions in colder climates. In such environments, icing conditions occur more frequently, and airports must be better prepared. While

Vaisala's FD70 is able to measure the drop-size distribution and velocity of falling hydrometeors and offer present weather detection of conditions that were previously hard to identify.

passenger airplanes can operate in icy conditions, timely awareness is critical for maintaining safe and efficient operations for all types of aircraft.

Taking on Impaired Visibility

Across the globe, low visibility cancels, delays or disrupts flights every day. From rain, fog, snow, sleet and other particulate matter, obscurants can negatively affect visibility, which is especially crucial when the aircraft is maneuvering on or close to the ground.

Good visibility optimizes airport efficiency by maximizing inbound/outbound aircraft capacity, while impaired visibility forces airport operations to slow down to ensure safe departures and arrivals. Most automated weather observing systems struggle to identify these conditions, and human observation is typically necessary to validate the presence of icing. Observers often compile their reports by integrating sensor measurements with visual observation of known landmarks, but human estimation is subjective and prone to error. Without reliable, accurate visibility information, airports cannot operate safely — nor at full capacity.

Categorized airports must have instrumented meteorological optical range (MOR) measurements and a system calculating runway visual range (RVR), the essential factor for enabling air traffic control and pilots to make the correct operational decisions. Visibility, or MOR, can be measured with two approved technologies: transmissometer and forward scatter, with transmissometer technology like Vaisala's LT31 transmissometer. Forward scatter technology, such as Vaisala's FD70, is, in addition to the meteorological visibility (MOR), able to measure the drop-size distribution and velocity of falling hydrometeors and offer present weather detection of conditions that were previously hard to identify.

These advances enable automated weather observation platforms to accurately identify real-time conditions in an autonomous operating mode, delivering detailed particle-by-particle analysis that allows for highly reliable frozen-liquid differentiation. The capability to differentiate between frozen and liquid particles and other precipitation identification is essential for visibility and present weather, including RVR.

Wind Shear: Addressing Shifts in Wind Patterns

From wind shear and microbursts to gust fronts and wind shifts, wind remains one of the most dangerous — and difficult to assess — weather hazards. While it may not be the first weather event that comes to mind when addressing winter storms, the sudden change in the direction or velocity of wind, also known as wind shear, is an essential consideration. Most commonly resulting in delays and cancellations, wind shear can also quickly create dangerous situations during take-off and landing when aircraft might not be able to withstand severe wind-caused disruptions to their flight paths.

While there is no mandate to measure or detect wind shear, failure to do so effectively can put lives at risk and lead to crippling financial damages. Consequently, the impact of wind shear should be accounted for since it occurs at a height and under flying conditions in which aircraft are most vulnerable.

The best aviation weather management systems for wind shear incorporate a combination of up to three measurement technologies: a low-level wind shear alert system (LLWAS), weather radar and scanning wind lidar. LLWAS measures average wind speed and direction using a network of remote ultrasonic sensors fixed around runways and along approach and departure corridors. In addition, weather radar, used during precipitation, can measure the wind field from the entire aerodrome and beyond. Scanning wind lidar, used in clear sky conditions, provides wind shear detection, 3D wind information and wind inversion detection that can measure the entire field, from the runway and its approach and take-off areas.

With real-time detection of wind shear, decision-makers can predict wind changes to prevent accidents and make runway changes to improve airport efficiency.

Embracing Innovation in Aviation

From maintaining scheduled operations to keeping employees and travelers safe, decision-makers with precise and timely weather information can adapt, rapidly react to changing conditions and reduce disruptive delays. Technological advances have opened the door for airport decision-makers to measure and detect severe weather and take the proactive steps necessary to minimize delays and cancellations while keeping operations running as safely and smoothly as possible. With the right aviation weather solutions in place, airports can not only be prepared for winter weather but have the information on hand to address any severe weather event throughout the year. **GSW**

ABOUT THE AUTHOR

KARI LUUKKONEN

Kari Luukkonen has a long experience in various roles at Vaisala. Over the last five years, he has been managing Vaisala's offering for aviation systems and services. His work includes driving the development of the overall weather offering to meet the current and future needs of the aviation market.

A Passenger Stairway for Larger Aircraft

Stinar's SPS-3518 reaches boarding doors of the A300 to the B777.

BY REBECCA KANABLE

Already having a smaller model of chassis-mounted boarding stairs in its portfolio, the design for Stinar's SPS-3518 model was inspired by customer requests for stairs that could service larger aircraft.

Stinar's SPS-3518 Passenger Stairway reaches boarding doors with sill heights of 96 to 228 inches. That means it's compatible with aircraft the size of the A300, A320, A340 and B777 and the lower doors of the A380, offering a passenger boarding solution at areas other than terminals equipped with jet bridges.

"It's functional in that it opens up services that otherwise may not have been attainable with the current facilities operators have now," says Stinar CEO Craig Kruckeberg. "A mobile boarding stair has many benefits when it comes to air travel."

The SPS-3518 Passenger Stairway uses a hydraulic lift system operated by the commercial chassis PTO.

The telescoping stairway consists of two stair sections supported by an A-frame with an integral ratcheting system. The lower stair section is stationary while the upper stair section telescopes into position and features an ergonomic front-boarding deck with extension platform, swivel bumper and proximity safety sensors.

Controls are located in the chassis cab and on the boarding platform. Inside the cabin, controls are used to raise and lower the stairs, adjust the A-frame, and raise and lower the stabilizers at the front, middle and rear of the chassis.

Lowering the A-frame also requires releasing the A-frame lock release switch. This actuates an electric solenoid, which releases the A-frame ratchet—a mechanical lock that prevents the A-frame from being lowered unless the switch is engaged.

At the top of the stairs, on the boarding platform, controls adjust the A-frame and stairs as well as extend the platform, which is 83 inches long (133 inches long with the landing) and 72 inches wide.

Attached to the underside of the platform, a camera allows adjustments of the platform to the correct door height of the aircraft. The camera's video can be viewed from a monitor inside the cab.

Safety features include cab warning lights that indicate stabilizer position, a backup camera and an amber flashing beacon. What's more, in the event that the hydraulic system fails, there's an emergency power pack. If the emergency power pack fails, there's an emergency hand pump.

"Numerous safety measures have been added in the form of proximity sensors, safety alarms, checks and integral measures that must be done for the stair to operate as designed," Kruckeberg says.

"We provide onsite product training for each new unit purchased and will come and train new employees on older units in the field for customers looking for refresher training. We've gone to great lengths to make assure all equipment, planes, operators' and customers' safety is priority number one for Stinar units."

Other key features, according to Kruckeberg, include lock valves on all hydraulic cylinders, an integrated ratchet system, multi-functional stabilizers with pressure sensors and heavy-duty OEM cab/chassis capable of supporting the boarding unit and the passengers on the boarding system. After the SPS-3518 was introduced in February 1984, customers made requests for options. Today many of those requests now come standard.

"We've taken most of those options and made them standard, expanded on them some, added additional features and offer a fully loaded passenger boarding stair," Kruckeberg says.

STINAR

The Stinar Passenger Stairway, Model SPS-3518, is a hydraulically operated, two-section elevating stairway that is supported by a telescoping A-frame. The lower stairs section is stationary, while the upper stairs section includes the platform.

STINAR

Construction of Stinar's SPS-3518 includes a steel frame with aluminum panels, diamond plate steps and platform, and stainless steel handrails.

According to Kruckeberg, key options available to customers today are the color of the stair unit, OEM chassis make and OEM engine fuel type (diesel or gas).

"We are looking to add EV options as well," he adds.

"Several updates were made with more being integrated as Stinar continually builds out units for customers and tweaks the little things they want to make better," Kruckeberg continues.

Today, the SPS-3518 is in use all over the world, from commercial airports and FBOs to government bases and foreign operations. Customers include ground handlers, airlines and airports, but of late Kruckeberg says the biggest users of the passenger stairs have been ground handlers and FBOs that are expanding their charter services.

Customers love it, in part, he says, because it's easy to operate.

In addition to the SPS-3518, Stinar's current passenger boarding stair lineup includes the SPS-6018, SPS-6018evf, SPS-5519/SPS-7026 and PS-813B/E. All are telescoping boarding stairs. The drivable units utilize an OEM cab/chassis and they all are designed, built and warrantied by Stinar. The difference lies in boarding stair widths. Units that specialize in ARFF operations are SPS-6018 and SPS-6018evf, units designed for government/military use are SPS-5519 and SPS-7026, and Stinar's most recognizable unit for commercial use (SPS-3518) has a towable version (PS-813B/E).

"From design to manufacturing, our team at Stinar stands behind each unit that is rolled out our doors. From holding tight tolerances to following the ICAO and IATA recommendations on our units, meticulous thought goes into each of our parts. From utilizing premier Class 5 OEM chassis to assuring our machined lock valves are thoroughly tested, the product we put out is backed by an industry-leading warranty for a reason – quality," Kruckeberg says.

When ground service providers are selecting stairs for their operation, Stinar officials recommend considering the location of boarding, the personnel dedicated to passenger boarding, a facility's features, options for refueling and the type of aircraft being serviced.

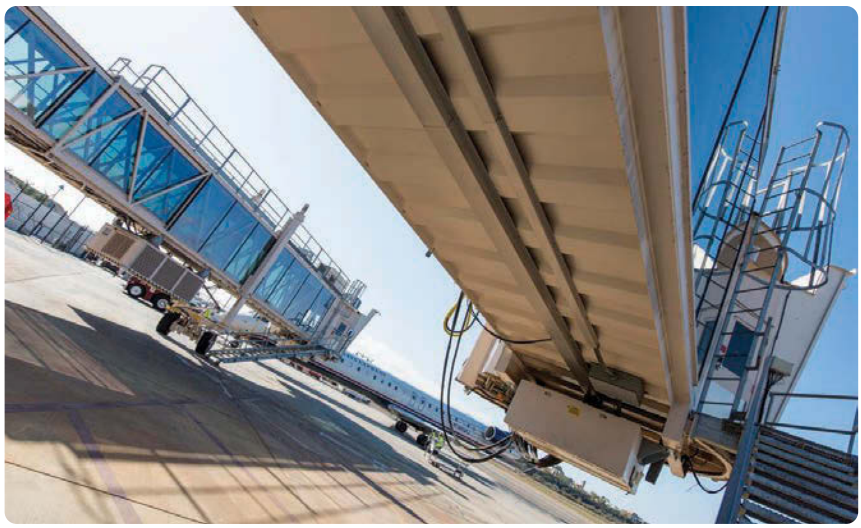
"If they are looking at a towable unit, do they have the equipment to pull the stairs?" Kruckeberg offers as an example, adding frequency and quantity of passenger boarding play a key role in considerations. "If they are doing multiple boardings per day, in several different spots, adequate equipment like our SPS-3518 will be key to them."

Stinar officials also note their stairs offer options that can help ground handlers navigate the challenges associated with specific geographic locations, climates, traffic volumes and other needs. How can geographic location, climate, traffic volume, etc., influence a customer's need when making a selection?

"Their primary thing to consider is the fueling of the vehicle and the type of fuel available to them," Kruckeberg says.

According to Kruckeberg, normal care and maintenance goes a long way in keeping equipment such as passenger stairs in good working condition.

"We provide an operations/maintenance manual with a full rundown of preventive maintenance and frequency to those PMs. Grease is a good thing when it comes to our stairs, each zerk is labeled for the operator's team to provide adequate care," he says. "Regular cleaning, preventive maintenance and proper operations will keep your SPS-3518 lasting many, many years." **GSW**



JETWAY BOARDING BRIDGES

JBT CORPORATION

JBT designs, manufactures, installs and provides support for airport gate equipment. Jetway Boarding Bridges come in steel, glass and smooth-sided models and are suitable for serving regional jets up to double-decked jumbo aircraft. Other JBT gate equipment includes JetPower ground power units, JetAire pre-conditioned air systems and the innovative iOPS equipment monitoring service.

AviationPros.com/10024665

LOADING BRIDGE CANOPIES

ESTEX MANUFACTURING CO. INC.

Estex Manufacturing Company has been supplying loading bridge canopies for 20+ years. The company manufactures all styles of replacement canopies and its tough and dependable fabrics meet specifications NFPA 415 & 417, as well as FAR 25.853(b). Estex Manufacturing Company also supplies installation hardware kits, facia pads, adapter pads and corner pads.

AviationPros.com/21210225

ESIDEBULL

BULMOR INDUSTRIES GMBH

Offering a reduction of up to 400,000 kg in CO2 emissions, the Bulmor ESideBull for passengers with reduced mobility (PRM) assistance is fully electric and provides safe travel with zero emissions. Lead acid or fast charge lithium-ion technology is available. Additional features include one-person operation with driver's seat in the passenger cabin; compatibility with all aircraft types up to A340; wind stability up to 100 km/h; a lifting height of 8,100 mm; HEPA filter technology that removes 99.9 percent of all airborne viruses; and temperature control and climatization during vehicle parking without battery consumption.

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ELECTRIC SELF-PROPELLED PASSENGER STAIRS

TIMSAN

Timsan's Electric Self-Propelled Passenger Stair series has various service height range configurations from 1,800 mm to 6,000 mm with its robust, durable and reliable chassis and stairway. The EPS series has high stability capability against wind speeds up to 75-100 km/h with four synchronized electro-hydraulic operated stabilizers. The powertrain consists of 80 V AC electric traction motor, hydraulic pump motor, drive axle, 80 V DC battery pack and high efficiency AC motor controller with re-regenerative braking system. The front platform has sliding side panels of 1,100 mm height to be countered to suit the aircraft profile and has swiveling part for ease of alignment to the aircraft fuselage.

AviationPros.com/21283888

TRUCK-MOUNTED STAIRS

PHOENIX METAL PRODUCTS

As part of Phoenix Metal Products, Inc.'s full line of stairs, the model PNX-PAS228 Truck-Mounted Passenger Stair offers a door sill height from 96 inches down to 228 inches up. The chassis is a Ford F450 SD with six stabilizers.

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PBB REMOTE CONTROL OPERATING SYSTEM

ADELTE

ARCOS is an innovative system specifically developed to enable passenger boarding bridge (PBB) operations in a remote, safe and fast manner. ARCOS is composed of customized desk(s) located in a technical room of an airport where trained operators remotely perform PBB docking and undocking procedures. Due to the interconnectivity of all PBBs, with one centralized and secure system, the required number of operators can be reduced by 65 percent and docking times by 20 percent.

AviationPros.com/21154166

APS 60 SERIES TRUCK-MOUNTED AIR STAIRS

ACCESSAIR SYSTEMS INC.

The APS 60 Series Truck-Mounted Air Stairs are available with a wide range of options including an overhead canopy along with two air-driven canopies located at both the top and the bottom of the stairs, giving passengers complete protection from the elements. Normally mounted on a Ford XL F550 series and available in gas or diesel models, the most recent edition includes an automatic handicap wheelchair lift.

AviationPros.com/12441216

APX20-DPL BOARDING LIFT

LIFT-A-LOFT CORPORATION

The APX20-DPL has a maximum platform height of 21'5" with a minimum platform height of 4'9", allowing a single unit to interface regional jets up to wide-body aircraft. The fully enclosed cabin provides comfort and two windows on each side provide natural light in the cabin. Units can be provided with optional air conditioning, an intercom system and fold-down seats. The APX20-DPL is equipped with an auto-close folding lift gate, which can be raised or lowered by one person. The lift gate measures 77" wide by 84" long and can accommodate two stretchers or four wheelchairs to be loaded in one lift cycle. The lift functions can be operated from either the driver's cab or by a pendent located in the van body.

AviationPros.com/12132833

Q-400 PASSENGER STAIRS

KEITH CONSOLIDATED INDUSTRIES

The Q-400 Passenger Boarding Stair is designed to accommodate passenger boarding at the L2 door of the aircraft. The Q-Stair is lightweight and easily maneuvered and deployed by one individual in less than 1 minute. The Q-Stair is designed with functionality and safety in mind, with its angled platform and folding gate. The Q-Stair is equipped with a roll-away stantion and retractable ribbon reel, that when used in conjunction with the Q-step, forms an overall Q-400 system. This system allows the under wing area to be cordoned off, directing the passengers around this area.

AviationPros.com/12083080

SIDE SHIFT CAB MODEL 269L

R.J. DESIGN LLC

This Side Shift Cab promotes safety for passengers and ground personnel. The side shift is located on front of PBB cab and shifts 18 inches left and right, making docking easy and loading and unloading passengers faster and easier.

AviationPros.com/21284214

PAXLIFT

BAUMANN S.R.L.

The PaxLift Ambulift from Baumann lifts from ground level to 8 meters, and offers integrated suspension, multi-purpose use and four steering wheels for maximum maneuverability. The PaxLift has a 100KW diesel engine for a speed up to 30km/h for ground support equipment operators. It also provides a dedicated Airport Passenger Transport design and high lifting capacities (up to 2.000kg). Additional benefits include space for six wheelchair passengers with assistance, a compact design (3,100mm height and 2,550mm width), a small turning radius (less than 7 meters) and one-man operation.

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PRM SERVICE PLATFORM

DENGE AIRPORT EQUIPMENT

DENGE has developed a PRM ramp which is very light and flexible and extremely easy to maneuver. Moreover, it is very narrow and short while folded when not in operation. It has an adjustable height, can carry passengers safely so the embarkment of the PRM to the aircraft with the passengers at the same time maximizes the speed of handling for users, offering an advantage to both the airline and ground handler.

AviationPros.com/21268816

MOBILE STAIRS

WOLLARD INTERNATIONAL

Wollard International Mobile Stairs can reach doorsills up to 228". The company offers the CMPS 170 Stair and CMPS 228, which offer a reach of 170.5" and 228", respectively. Both models are available with electric power. Diesel and gas power units also are available. The rugged wrap-around steel bumpers protect units from dings and dents inherent with ramp traffic, and the company says they hold up longer in the ramp environment compared to modified pick-ups.

AviationPros.com/12295209

JETBRIDGE CROSSHAIR ALIGNMENT DEVICE (JCAD)

A.C.E.S., INC. (AIRPORT & COMMERCIAL EQUIPMENT SUPPLIERS, INC.)

The JetBridge Crosshair Alignment Device (JCAD), an add-on to a jet bridge or passenger boarding bridge (PBB), is used to assist operators with its docking to the aircraft. Timing of aircraft deplane procedures are shortened while improving safety to passengers and aircraft doors. Eye-safe, low-intensity laser lines are used to target the aircraft door. The vertical line provides jet bridge cab alignment to the aircraft door. The horizontal line simplifies preferred height adjust of cab floor to aircraft floor.

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TARMAC BUS

VEERA VAHANA UDYOG PVT LTD

Veera's Tarmac Bus is fully air conditioned and offers a Euro IV diesel engine with fully automatic Allison transmission and Axle Tech front steer drive axle to ensure a smooth, comfortable, safe and fast turnaround time. At 14.5m long, 3m wide and with three wider doors on either side, it's designed in accordance with IATA AHM 950 and offers a carrying capacity of 110 passengers to assist quick boarding and de-boarding.

AviationPros.com/21076775

PASSENGER BOARDING STAIRS

TBD

Manufactured to withstand years of constant use in the most arduous environments with their rugged construction and superior finish, TBD's range of variable height telescopic and parallelogram-powered towable and powered passenger stairs represents a wise long-term investment. Designed for rapid but safe deployment to access wide, narrow and regional body aircraft, TBD's passenger stairs can reach doors across any fleet composition.

AviationPros.com/21076803

INTERNATIONAL MOTORIZED BOARDING BRIDGE

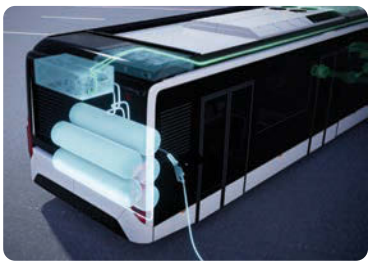
AVIRAMP

The Aviramp International acts like a fixed finger bridge, but for remote stands. The fully mobile, motorized boarding bridge is capable of servicing a range of aircraft from an Airbus A380 lower deck to an A320, as well as Boeing's B787, B777 and B757. The International incorporates a 360-degree, switch-back design to provide passengers a gradual slope, which makes ascending and descending the boarding ramp easier for both able-bodied passengers as well as passengers with reduced mobility (PRM). With optional solar-power functionality, one person can steer the passenger ramp remotely while positioned on the ground, and a number of safety overrides are in place to provide further assistance.

AviationPros.com/12393457

COBUS HYDRA

COBUS INDUSTRIES GMBH



The COBUS HYDRA is a hydrogen-driven airport bus. With its short refilling time and extended range, this fuel cell-powered airport bus offers a sustainable and state-of-the-art solution. Features include a refilling time of less than 9 minutes and an extended range of up to 400 kilometers. The vehicle is based on the proven e.COBUS 3000 as well as on a hydrogen-driven bus of the COBUS factory and shareholder CaetanoBUS. Customers can also convert their existing fleet into sustainable, hydrogen-powered buses providing low noise and low emissions.

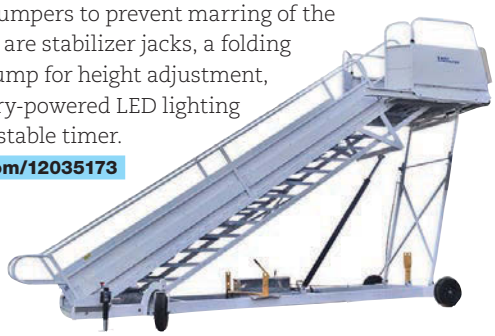
AviationPros.com/21280725

2820 PASSENGER STAIRWAY

AERO SPECIALTIES

AERO Specialties 2820 Passenger Stairway services aircraft with sill heights from 88-161 inches. Units feature an extra-large platform with sliding handrails to clear the aircraft door and soft rubber bumpers to prevent marring of the aircraft. Included are stabilizer jacks, a folding towbar, a hand pump for height adjustment, as well as a battery-powered LED lighting system with adjustable timer.

AviationPros.com/12035173



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Spotlight on: Diego Alonso Tabares

BY JOSH SMITH

Ground Support Worldwide: What attracted you to a career in the ground support industry?
Diego Alonso Tabares: The A380. I had the unique opportunity to participate on the entry into service of this aircraft. I worked together with airlines, airports, ground handlers and ground support equipment manufacturers to have everything ready for a smooth turnaround time.

GSW: What has kept you engaged in the industry?
DAT: The development potential. There are so many things to change and improve. The possibility to learn new things everyday.

GSW: What's the best advice you've been given while working in this field?
DAT: Whatever you make or develop in the ramp, make it bullet proof. (from Bernhard Scholz at Fraport)

GSW: How have you seen the ground support industry change the most during your career?
DAT: Low cost race to the bottom, although now it looks it has hit the ground.

GSW: What's the next big thing coming to the ground support industry?
DAT: Full automation of GSE around the aircraft and at the airport.

GSW: What type of an impact will it make?
DAT: We don't have enough people to work on the ramp. If we want to sustain existing traffic or grow it, we need to automate tasks and make the ramp a better working environment.

GSW: What would you say to encourage someone to join the ground support industry?
DAT: It is worth to try, [and is] a very good place to get to learn how the air transport works.

GSW: Any final thoughts?
DAT: There is no flight without ground support and there have been plenty of examples last year to illustrate this. The air transport industry needs to recognize the importance of ground support in the overall system. And the first step is to acknowledge it ourselves as ground support people. GSW

Job Title: Airport Operations Senior Engineer
Company: Airbus
Location: Toulouse, France
Years of Experience in Ground Support: 20
Years with Current Company: 20
Industry committees, associations and working groups served on:
SAE AGE-3 Aircraft Ground Support Equipment Committee. Participant since 2008; Chair 2011-2020

SAE G-12 Aircraft Ground Deicing. Participant since 2012

ISO TC 20/SC 9 – Air Cargo and Ground Equipment. Chair since 2019; Participant since 2008

BNAE – Commission Fret et matériels aéroportuaires. Chair since 2019; Participant since 2008

CEN TC 274. Aircraft Ground Support Equipment. Participant since 2008; Head of French delegation since 2019

IATA GSEE – Ground Support Equipment and Environment. Participant 2013-2019

ICAO – International Civil Aviation Organization. Aerodromes Design and Operations Panel - Advisor for ICCAIA since 2021

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★★★★★★★★★★★★★★★★★★★★

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