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AUTUMN 2022 #AIRSIDEINT

HIGH-TECH TUGS AND TRACTORS

MANUFACTURERS MEET DEMAND FOR ELECTRIC PUSHBACKS AND BAGGAGE TUGS

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Editor's NOTES

Mike Bryant
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Welcome to the Autumn 2022 issue of *Airside International*, in which the features consider the changing demands relating to GSE in the fields of de-icers and tugs and tractors, and how suppliers and operators are using new technologies to provide more efficient, more sustainable services.

Innovation in GSE is a key theme, with three articles devoted to new technologies that are moving GSE capability forward, whether in terms of lithium-ion batteries, cutting-edge hydrogen fuel cells or a specific and innovative type of battery-powered belt loader.

We hear about the latest offerings from Aviramp, a provider of a unique range of passenger boarding equipment, and learn all about XOPS, the integrated platform that delivers real-time data that can be used to track, monitor, schedule and manage GSE.

We meet with EINSA and Miles GSE, respectively Spanish and Turkish GSE providers, who are both expanding and developing their ground support equipment portfolios to meet evolving customer demands, while France's Air Business Corporation (ABC) talks to *Airside* about its specialist aviation solutions, including GSE refurbishment.

The handlers that operate these various GSE lines are not forgotten. EULEN America, ABM Aviation and Swissport all offer thoughts on various improvements they are making across their businesses, whether it be in the emphasis on sustainable GSE at Swissport's extensive Moroccan operations, the forward-looking strategies of ABM Aviation's new managing director, or how EULEN America is positioning itself for growth amidst the rapid recovery of the international aviation industry.

Finally, we learn all about Agility's acquisition of Menzies Aviation and what this means for the ground services provider and its customers, and we report on the latest good news for the groundbreaking WheelTug system: Spanish carrier AlbaStar has signed up as its European launch customer.

We hope you enjoy the issue.

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Issue 59
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ISSN 1755-8697

EVA INTERNATIONAL MEDIA LTD
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Published by:
EVA International Media ltd
Boswell Cottage
19 South End, Croydon
London, CR0 1BE, UK

Tel: +44 (0) 20 8253 4000
Fax: +44 (0) 20 8603 7369

www.evaintmedia.com

Printed by:
The Manson Group Limited
St Albans, Hertfordshire
AL3 6PZ, United Kingdom

Distributed By:
Asendia UK LTD
Heathrow Estate
Silver Jubilee Way
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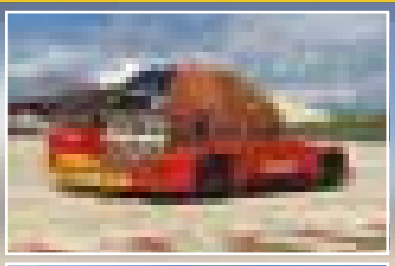

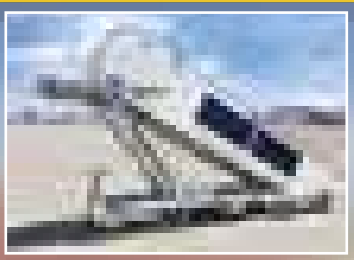

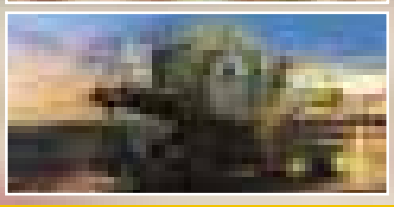
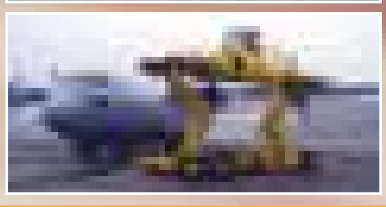

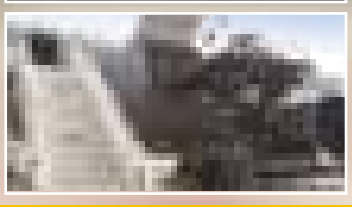

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A Goldhofer battery-powered PHOENIX towbarless aircraft tractor deployed by German handler Lufthansa LEOS

Technology changes in the design of tugs and tractors

The move towards electric GSE seems unstoppable and nowhere more so than in the area of pushbacks and baggage tugs. Other technological developments are also improving the offering of many of the big suppliers of these specialist vehicles

TLD, part of the Alvest Group that also includes Aero Specialties, Smart Airport Systems (SAS) and Alvest Equipment Services (AES), offers a comprehensive range of GSE and is a leading supplier of conventional aircraft tractors and towbarless aircraft tractors, as well as baggage tugs. It is heavily involved in the innovative driverless TractEasy baggage tug and semi-robotic, pilot-controlled TaxiBot pushback.

According to TLD Group CEO Valentin Schmitt and TLD's Alvest Group product and innovation director Laurent Decoux: "The Covid crisis has been a challenge, but we trusted in our industry and our customers and decided to keep all our industrial capabilities focused on product development around our 'Leaner & Greener' baseline.

"Considering this, we feel we are very well prepared for the future, having a

renewed product line, fully available in electric and now complemented by both hybrid and pluggable hybrid solutions, plus we have the foundation of a very capable industrial footprint of 10 factories on three continents."

Today: "The industry is rebounding, there is no doubt, but our current business is very different from the one we had pre-Covid. The new environment the aviation industry faces is making our customers consider new dimensions for our products, in which TLD has been investing for years," Schmitt and Decoux observe.

"Now, more than 60% of our manufactured products are electric, while TLD solutions are adapted to the existing infrastructure constraints [found at airports] and so are also an accelerator for those who have been willing to move to electric but were limited by the lack of chargers or other power availability.

"These TLD solutions are very versatile, from hybrid to battery power including off-the-shelf hydrogen, and can adapt to almost all types of infrastructure available."

TLD has been developing electric tractors for more than 20 years, starting with the TPX-100-E that has been available since the early 2000s and is now in use around the world. "That experience is essential to properly address the electric challenges of today," say Schmitt and Decoux.

TLD's expertise is allowing it to meet today's challenges, "controlling and integrating the latest battery technology, optimising their performance and issues relating to charging. The eGSE [electric GSE] we are today proposing to our customers is the best in class of that technology, backed up by years of expertise," they declare.

Increased efficiency

The aviation industry is now facing an almost global manpower shortage, Schmitt and Decoux remark, and so increasing efficiency by means of automation is becoming increasingly valuable. From TLD's latest release of its Aircraft Safe Docking (ASD) technology which is available across its aircraft-interfacing GSE and includes a no-touch option, to a fully Level 4 driverless solution for GSE now in commercial operations, such as ASD+ and Advanced Driver Assistance Systems (ADAS) that enable automatic and safe docking to an aircraft, TLD has – it says – "developed an integrated vision of ramp automation".

Schmitt and Decoux note that this vision is helping TLD's customers to move toward 'two-man turnaround' operations.

"A good example of this is the baggage tractor. Just a little while ago, this was commonly a diesel unit, and even sometimes an agricultural tractor. In the course of just a few years, our market has totally shifted to electric units, mainly with lithium-ion (Li-ion) batteries, and growing demand for the TractEasy, the driverless version of our machine, now in

Are electric tractors the future for aircraft pushbacks?

commercial operations," they say.

A primary focus for TLD of late has been the development of its 'Alternative Power Source' package. This enables customers to select their preferred electric GSE power source, whether it be Li-ion batteries, hybrid, pluggable hybrid or hydrogen. The choice will match the relevant available airport infrastructure but can be changed if that infrastructure evolves (for example, with the installation of more chargers at a given airport) or changes (should the unit be moved from one location to another, for instance).

Alternative Power Sources are available for a wide range of TLD units, including its baggage tractors and conventional and towbarless tractors.

This year has also seen demand for larger electric tow tractors, say Schmitt and Decoux. TLD's conventional TMX-150 pushback tug and TMX-350 electric version offer "proven and reliable solutions for pushing and towing aircraft of up to widebodied size". The TPX-200 series has also been complemented by the addition of an optimised version called the TPX-200-XE, already in operation in many locations.

Meanwhile, the innovative TaxiBot pushback design continues to gain traction. Two TaxiBot pushbacks are to be delivered to Amsterdam Airport Schiphol before the end of the third quarter of 2022.

Finally, with regard to baggage tugs: "Our level 4 driverless TractEasy vehicle has passed major milestones this year, and is now in commercial operations, towing cargo every day without a driver! With a few dozen units in operation around the world, the technology is now accelerating."

A wide-ranging portfolio

The range of the TLD offering and its value for all types of customer can be illustrated by reference to one product line by way of example: its TPX-200 series towbarless tractors. TPX-200 series units are operating in the hottest and coldest climates on earth, Schmitt and Decoux point out, from humid and deserts environments to seaside regions and at high altitude. "All those different conditions are making us improve our machines, one after the other, growing our reliability."

They go on: "In parallel, with the development of the TPX-200-MTX version, we've been able to manoeuvre every aircraft except A380s and B747s, for which you need our larger version. This makes the unit extremely versatile.

"Finally, with the same TPX-200 series cabin and interface, you now have a diesel, an electric and a hybrid version, the use of any of which requires no additional training.

"So, we have a unit suitable for any requirement and for any customer, but on many occasions, that unit is the same for everyone.

"But at the end of the day, the most important feature for us remains our focus on quality: our tugs and tractors are simple, reliable and easy to maintain," they conclude.

SOVAM pulls its weight – and more

In July 2017, the Parthenay, France-based GSE supplier SOVAM was acquired by Irish investment fund Abbey International Finances, and that was the start of a real revitalisation of the business.

A process of reorganisation and restructuring followed, one that was recognised externally by SOVAM being awarded ISO 9001 quality management accreditation in January 2019. And from then, indeed: "Over the last three years, we have rebuilt a new SOVAM," says the French GSE supplier's managing director Alain Peru, who regards ISO 9001 certification as a milestone and due recognition of the changes that had already been put in place by 2019.

Today: "We are ready to serve our traditional commercial markets of Eastern Europe and French-speaking Africa, but also export markets more generally, as well as military markets."

He continues: "We are ready to regain a stronger foothold in our local market – Europe – thanks to the combination of our advanced product ranges at a time of new European standards.

"We are proud to offer a wide range of airport-related products, French-made, reliable and robust, price-competitive and meeting the binding standards of the aviation industry. Plus, GSE is available at short notice, as a result of the implementation of modern logistic process and strong partnerships with our suppliers," Peru adds.

Today, SOVAM's portfolio includes pushbacks, tugs for baggage handling or for pulling pallet and container dollies,

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and cargo tractors (as well as passenger steps and water service vehicles).

During the Covid crisis, SOVAM had to stay positive and try to turn the crisis to its advantage – "to not only resist but to come out stronger", Peru remarks.

"We chose to believe in a [full] resumption of aviation activity and we put in place an order of battle to be ready for the future: to continue the modernisation and industrialisation of our manufacturing tools, to create a more environmentally friendly range in response to the decarbonisation strategies of our customers and prospects, and more broadly to meet the environmental challenges that we must all face.

"This included developing products such as electric passenger steps and electro-refitting maintenance platforms. And, finally, we looked to complete our product offering, to offer equipment such as catering vehicles and for people with reduced mobility [PRM], for example." (SOVAM had stopped offering catering vehicles and PRM GSE as money ran short prior to 2017, but is now going back into these markets. The first of its new units in these lines will be available by the late summer.)

Breathing space

Prior to the pandemic, demand for electric GSE amongst SOVAM's existing customers and future prospects had been relatively light, Peru says. The company did offer electric maintenance platforms, but not battery-powered tugs or tractors. But now, he says, there is much greater demand than there was before; moreover, the pandemic offered the company the breathing space to think more about electric GSE.

In this it was supported by the French Government, which offered a substantial grant (in the region of 440,000 Euros, or about US$462,000) as an element of the assistance it offered to French companies during the pandemic, at least in part thanks to SOVAM's decision to deliver more environmentally friendly GSE to its customers.

SOVAM initially began offering battery-powered passenger steps, the range launched in spring last year. It then took the decision to offer an electric refit of its maintenance platforms as well as passenger stairs, and has – for example – been involved in tests with Airbus on battery-powered maintenance platforms. Whether these developments will lead to the launch of battery-powered tugs or tractors is yet to be decided, however.

Meanwhile, SOVAM launched a new range of CE-certified 'European' tractors in March 2020, in the midst of the Covid crisis. The company breaks down each of its product lines as specifically designed for three particular markets: 'European', 'Export' and 'Cold Climate'/'Extreme Winter' (for the latter, Russia has, for instance, traditionally been a key market for SOVAM). Previously, SOVAM had offered a limited range of tractors of up to 40 tonnes that were not specifically designed for the European market, but the March 2020 launch changed that.

SOVAM offers the K100-8, K100-10 and K100-12 tugs for 'Export' customers and K22, K32 and K40 baggage tugs (the numbers refer to the tugs' pulling capacity in tonnes) both for the European market and further afield in the 'Export' market.

"Our tugs and pushbacks are, like all our products, reliable and robust," Peru describes. "And we now ensure the highest standards in delivery times in the industry and offer an equipment customisation service."

A TLD TPX-200-XE electric tug working with Air France at Paris Charles de Gaulle International

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As for the future: "Product development is an endless ongoing process," says Peru. "The trick is to understand and anticipate new customers' needs.

"But we are now offering the best technologies available alongside the best possible after-sales service," he concludes.

JBT benefits from LEKTRO addition

JBT offers a wide range of both conventional and towbarless tugs, and has done so for many years. What has changed fairly recently is the addition of the LEKTRO brand of electric towbarless pushback tugs, the Oregon, US-headquartered company having been acquired by JBT in 2019.

LEKTRO is now fully integrated into JBT and the acquisition has, says Henry Balensifer, LEKTRO products – sales & marketing, "greatly improved our ability to support international clients".

Indeed, adds Jesse Long, director, sales & customer care for JBT LEKTRO: "The integration has gone very well and we are fully functioning as a JBT AeroTech location. In fact, some of our production capabilities are even being used to support products manufactured in other JBT locations."

Balensifer opines: "Obviously any acquisition comes with trepidation about change. However, when [former LEKTRO owner] Eric Paulson sold the company, he was very adamant that the acquiring entity had to have products with a similar design (both easy to operate and maintain, and reliable), and with a similar customer-centric culture.

"JBT bought our small company and modernised it, with new investment into the factory, new management techniques to improve efficiency and improved IT systems. This has benefited us greatly."

Long agrees: "The transition from being privately owned/operated to being part of a large, publicly traded company is certainly a big transition and change is always painful.

"However, JBT did a wonderful job managing the speed at which changes were made and doing everything possible to maintain the strengths of the LEKTRO name and operation. As far as customers are concerned, there still seem to be some who don't yet even fully know or comprehend that we were purchased. For those that are aware, however, there are certainly different levels of optimism but I am confident that, as time progresses, everyone will be increasingly aware of the many positive changes that have resulted from this transition/merger.

A LEKTRA 88 with a Gulfstream G700 aircraft

"As director of sales & customer care, I have been extremely sensitive to how this change has or will affect our customers. I am excited to report that being a part of JBT has done nothing but expand our availability to our customers and our ability to support them – both with regards to sales and after-sales support."

Balensifer also believes that the biggest value-add for LEKTRO products being part of JBT is the worldwide customer care and broad-based support that the larger enterprise can offer. Prior to the move to JBT, LEKTRO's customer care involved a lot of third-party service providers over which it had little control in terms of service and quality, he recalls.

"Now, we have a much broader service and support capability worldwide in addition to the US-based factory. This is something we are still trying to get the word out to customers about."

LEKTRO is now one of many brands of JBT products and the name will continue to exist. "The LEKTRO name has an immense amount of value in the market," Long points out. "As a result, our units will continue to be referred to as LEKTRO tractors (similar to the way the B-Series tractors, Ranger and Commander loaders and Tempest de-icers which are also manufactured by JBT are branded)."

Something for everyone

There are over 6,000 LEKTROs now in operation across 95 countries. In LEKTRO's early days, it primarily sold smaller, stand-up models (its 86s and 87s). The biggest seller a decade ago was the LEKTRO 86, but as general aviation aircraft keep getting larger, the LEKTRO 88 became the top seller. A larger, sit-down model, the 89, is also now much in demand.

"We believe each model meets a specific niche or need," says Balensifer. "Our units are reliable and our support is industry leading. When Covid hit, we may have had to cut back on production staff, but we never cut back on procurement, parts

or service staff. In fact, we continue to expand the availability of those services, especially to our international clients."

"We are proud to serve virtually every sector of the aviation industry – general aviation customers, commercial aviation customers, military operators and also many of the OEMs [original equipment manufacturers]," says Long. "Our goal has always been to provide solutions with the broadest market value possible, and this has not changed."

Says Balensifer: "We have also developed units not in commercial production that are specific to military needs, and while those are not currently commercially available yet, they could be amended for general aviation use."

JBT's LEKTRO military models are designed according to their target market. For example, units deployed into Middle Eastern countries have different options on them than those serving with US, Asian, or European militaries. "They are bespoke to the needs of those militaries," Balensifer informs.

Powering up on electric

"With the first all-electric LEKTRO aircraft tow tractor built in 1967, it is like the rest of the world and the various markets themselves are only finally starting to catch up," says Long. "LEKTROs have always been electric. We have always been 'green' and we are committed to this long-term.

"Being 'green' is obviously a big part of what has always made our products so popular. But LEKTRO tractors are also known for being extremely robust and incredibly universal, and their long life provides an extremely high ROI. All this, combined with our unparalleled support remains key to our success."

And for Balensifer: "LEKTRO began developing electric tugs over 50 years ago because they provided increased safety, higher reliability and lower maintenance costs. And as a company, JBT cares deeply about the environment and continues to invest in leading the GSE world, not just following trends.

"We have produced hydrogen fuel cell options in some products, and continue to explore other possibilities. The future promises cleaner and more environmentally responsible fuels. JBT's LEKTRO products used to have diesel-electric hybrid models, but as battery technology improved we saw no real need for them in the LEKTRO product line."

Balensifer continues: "We are currently improving existing models and have also developed several new product prototypes. We currently produce conventional tractors in our B Series tugs, with models capable of handling [aircraft as large as] B747s and A380s. We are adding range to our units with lithium options for our LEKTRO 89s and soon our LEKTRO 88s."

Long concurs. "There is no standing still in this industry. If you are not moving forward and diversifying, you are moving

The Goldhofer PHOENIX E

backward and will inevitably fail to meet customer requirements. We have our eye on several new offerings and also have some significant improvements already in our pipeline."

Goldhofer rides the electric wave

At Memmingen, Germany-headquartered pushback (and specialist heavy lift vehicle) manufacturer Goldhofer, sales director airport technology Christof Peer is fully in agreement with the JBT LEKTRO team and TLD that the move towards electric GSE is gathering momentum all the time.

"Due to the various programmes for the reduction of harmful environmental emissions at the most diverse of airports as well as the ever-increasing environmental awareness among ground handlers and our customers, there has been a clear shift in demand away from diesel vehicles towards electric-powered vehicles," he confirms.

"This is one of the reasons why Goldhofer has recently placed its focus on the electric tow tractor segment," Peer continues. That focus is reflected in the company's fully electric SHERPA E baggage tractors and PHOENIX E and BISON E pushbacks.

All these vehicles employ IonMaster technology that makes use of "extremely efficient" Li-ion battery systems and high-voltage technology of 400 or 700V, Peer informs. Plus, an active Thermo Management System (TMS) enables a significantly longer battery life even under the highest loads and extreme environmental conditions, such as heat or cold, he says. "Our solutions for the transition to all-electric operation enable consistently high performance, with fast intermediate charging in emission-free operation."

Pushbacks require a lot of power/torque but, says Peer: "Electric drive vehicles have a torque curve that offers the best possible characteristics for pusback applications and maintenance towers in order to optimally solve these challenges.

"As there continues to be lot of progress being made in the development of electric vehicles, we at Goldhofer are also constantly required to orient ourselves to these new development trends, and to adapt our electric vehicles," he continues.

And, as we have seen, some of those developments have been guided at least to some extent by the effects of the pandemic and resulting collapse in the aviation industry, Peer agrees. Thus, he argues: "It can be assumed that the trend towards procedures such as 'single-man pushback' has been further strengthened by the pandemic. These trends will have a lasting influence on the technologies used and thus also on the demand patterns of customers."

Of course, "There will continue to be markets for GSE equipment in the future which will rely on diesel vehicles due to their local infrastructure. Therefore, Goldhofer will continue to deal with diesel drives, [adopting] the latest technologies in this segment," Peer adds. ■

PHOENIX E supports AF in Sustainable Flight Challenge

In summer this year, the SkyTeam alliance of airlines launched a Sustainable Flight Challenge for its members. Carriers compete to maximise their environmental sustainability on a medium-haul and long-haul flight, the aim being for the carrier to create the smallest possible carbon dioxide footprint and then to share its experience and success gained with the other SkyTeam airlines.

Goldhofer is supporting its long-standing partner Air France in the competition through its electrically powered aircraft tractor PHOENIX E.

"With the PHOENIX E from Goldhofer, we can surely make a significant contribution to reducing our emissions in aircraft handling," says Rémy Delabeye, head of GSE and vehicles division at Air France. ■

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Ready for anything

The technology used to de-ice aircraft has remained largely unchanged for many years, but various efforts are being made to improve performance, safety and sustainability – while patterns of demand are shifting, too

Clear communication between cab and bucket is essential for safety and efficiency during de-icing; credit: David Clark Company and RDW Group

The electrification of GSE in general is high on the agenda these days as sustainability guides many business decisions – and on-airport de-icers are by no means exempt. Denmark's Vestergaard Company, for instance, has introduced electrically operated de-icing trucks to the market.

"We have tested our e-BETAs in several markets over the past winter and that has led to sales of about 20 units to go into operation in both Europe and North America in the coming winter," says Lars Barsøe, VP sales and marketing at Vestergaard. "Our first smaller, fully electric e-Mini MY Lites will go into operation in two European airports this coming winter.

"The new Elephant e-BETA technology reduces greenhouse gasses and sound emissions and creates better working conditions for personnel," he adds.

This year, Vestergaard has collaborated with a major handling company to win easyJet's de-icing operation (of which more below). The manufacturer is also to deliver four Elephant e-BETA de-icers to ground handler Airpro for use at Helsinki Airport this coming winter, making the gateway the first in the Nordics and only the fourth in the world to deploy electric de-icers.

Plus, Germany's Stuttgart Airport is to receive two of the electric de-icers this season, following successful trials undertaken in 2021.

Suppliers of de-icing fluids are similarly focused on sustainability. At Clariant, Fabio Caravieri, head of global marketing industrial consumer specialties, informs: "We introduced new fluids based on propylene glycol with improved ecotox profile in recent years: the type I Safewing MP I LFD 80/88, and type IV Safewing MP IV LAUNCH PLUS."

Caravieri observes that de-/anti-icing has matured over the last 15 years, especially on the application side of the task. "New development projects aim at keeping high quality standards but improve on the sustainability aspect such as optimisation of ADF [aircraft de-icing

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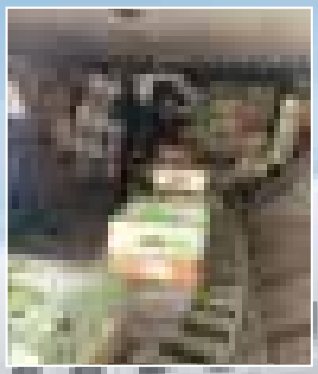

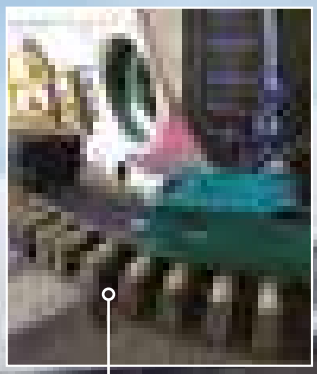

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Innovation for Aviation

A Vestergaard e-BETA de-icer during trials with Menzies at Oslo Airport

fluid] recycling, or utilisation of green and easily biodegradable raw materials," he says.

Over-arching such efforts are environmental regulations that must be followed. For instance, ADF is classed as a substance of very high concern (SVHC) in Europe, while Germany has its own classification of substances that are hazardous to water courses.

"The trend is certainly to use more environmentally friendly products," Caravieri says.

This trend looks set to continue, given that there are at present no feasible alternatives to glycol-based ADF for cleaning contaminated aircraft surfaces of frost, ice or snow.

"Other methods like external heating are simply too slow and consume too much energy. Special coatings usually only work under certain conditions for a restricted period of time. Therefore, a safety programme would still be required prior to every flight, plus a cleaning procedure similar to de-icing," Caravieri sums up.

There are other ways in which handlers can improve their environmental performance. At Nordic aviation services provider Aviator, managing director Jonas Brundin and head of deice Richard Lundgre remark: "Our Malmö station is CO_2 neutral when it comes to the equipment since we only use biofuels. We are also implementing that at our other stations in Sweden."

Plus, Aviator has invested in prop-mix vehicles instead of pre-mix vehicles, reducing the consumption of glycol, and has started to look at electric de-icing vehicles. "This season we are also changing our fluid supplier to one that uses more recycled fluid, which also reduces our CO_2 emissions," Brundin and Lundgren add.

With several companies specialising in ADF recycling, it seems likely that petrochemical suppliers will increase the share of recycled de-icing fluid in the mix. Alexandre Koenig, chief commercial officer of dnata Switzerland, considers: "There is a cost benefit to this, as well as environmental advantages. But recycling ADF is a complex operation: run-off can

be a blend of Type I, Type IV, water, ice... It's a challenge."

Communication

It is not just de-icing per se that is becoming more efficient: communication technology for winter operations teams has also matured.

Vestergaard is quite involved in this aspect of de-icing, having had a Data Transmission System since the early 1990s. This allows information on de-icing jobs to flow back and forth between airport operation and the de-icing truck and on to the cockpit crew, Barsøe explains. Precise information on fluid use, mix percentages, time stamps and geo-location is collected automatically.

"Communication around de-icing is very safety-related," he goes on. "Cockpit crews need to know exactly what mix was sprayed on their critical surfaces and possibly when a hold-over time starts so they can determine when it is safe to take off."

dnata Switzerland's ***Alexandre Koenig***

Vestergaard's ***Lars Barsøe***

As many de-icing contracts have an element of litre-/gallon-based invoicing, accurate data is crucial to the communication between customer and provider. Many airports also require exact reports on what fluid was sprayed, how much was collected and how much is run-off for their environmental reporting.

Aviator's de-icing teams, meanwhile, communicate via its airport radio system and VHF radio system. "We also have IT systems that take care of some of the communication between our co-ordinator and the vehicles regarding what treatment

is ordered and to monitor the operation," Brundin and Lundgren say. "We have been able to remove some manual work with the systems we have but it would be helpful to develop this more."

One provider of ramp communications systems that has been innovating is Worcester, Massachusetts-based David Clark Company. Echoing Barsøe, systems manager Bob Daigle points out: "There are numerous safety challenges that come into play during a typical de-icing operation. These include the use and handling of hot fluids and high-pressure spray, large de-icing vehicles moving around the aircraft, manoeuvring the boom, and poor visibility. To ensure safety during de-icing operations, clear communication between the sprayer in the bucket and vehicle driver is critical."

Ground support personnel have used communication headsets for many years in maintenance, pushbacks and other ramp operations. These were initially wired systems (such as David Clark's Series 3800) that provided clear communications in noisy airside environments. However, wired headset systems have their limitations: they constrain freedom of movement, while adding cords and cables to the ramp environment.

As such, the introduction of wireless technology represents a significant step forward. The David Clark Series 9900 wireless system allows hands-free operation and greater freedom of movement without the worry of tangled wires and cables (or the cost of replacing them if damaged).

Because the system is designed for full duplex communication, spray operators, vehicle drivers and de-icing co-ordinators can communicate with one another at normal voice levels, hands free and in real time, while moving the de-icing vehicle, manoeuvring the boom or handling a high-pressure hose. De-icing crews no longer have to yell at one another or rely on hand signals to communicate over the din of vehicle and jet engines, Daigle says.

Enhanced communication helps de-icing crews work more efficiently,

David Clark offers headsets specialised for aircraft de-icing work; credit: David Clark Company and RDW Group

reducing waste and run-off of costly de-icing fluids. Wireless headset communication can also reduce the time required to complete de-icing operations, in turn reducing flight delays as well as making a positive impact on an airline's bottom line.

Post-pandemic preparedness

Another frequent topic of discussion of late has been the readiness of the aviation industry for a return to pre-pandemic passenger numbers.

During Covid, Clariant stayed "effective, efficient and productive" throughout the pandemic; indeed, Caravieri declares: "Despite all of the challenges faced by the chemical industry, i.e. the shortage of MPG [monopropylene glycol] and disruptions in logistics all across the [European] Continent, we succeeded in securing our aircraft de-icer supply position all across Europe."

Handlers have their own contingency plans, of course. In Geneva, dnata Switzerland has ADF stored at the airport, as well as reserves in downtown Geneva and at Basel, while Clariant (one of its main suppliers) is based not too far away in Germany. So, Koenig says: "Even if we have a very intense start to the winter season with high demand for de-icing fluid, there will not be a shortage because we have reserves available [and] we monitor our usage of de-icing fluid and the weather forecast daily.

"In Switzerland, de-icing is a recurrent thing for winter and we are well prepared. There can be issues at smaller airports or those that in general have a very short de-icing season when for any reason that season is extended."

For manufacturers of de-icing trucks, though, the ongoing supply chain crisis is serious. Lead times on many major components have jumped 200-300% and prices have gone up by up to 75%, Barsøe remarks. "The leading truck chassis manufacturers have lead times of up to 15 months on their products so that affects us a great deal," he says.

This situation is filtering down to the purchasers of de-icing trucks, who are having to wait longer for spare parts and

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Two Vestergaard e-BETA units will join the Stuttgart Airport de-icing fleet this winter

new equipment. "We are also challenged in getting enough skilled staff," Barsøe continues. "The labour market in Denmark is on steroids, but we expect a slight downturn soon, so that pressure will ease."

The whole aviation sector is currently facing extreme manpower issues. Staff laid off during the pandemic are not as likely to return as might have been anticipated: many have found better-paid jobs with less shift-work. So, predicts Barsøe: "The chaos already seen this summer, where airports were not ready at all for the influx of passengers, will most likely come back even stronger in the coming winter season."

With air traffic levels likely to near pre-pandemic levels towards the end of this year, it is possible that providers will be short-staffed and unable to fulfil the de-icing contracts that they have signed. "I foresee several disputes that could result in torn-up contracts and new players entering the market," Barsøe says. "The current downturn and inflation spike may dampen the pressure on airports, but as a lot of us predicted, the 'ketchup effect' is there: people have pent-up travel needs that will keep the industry booming for a long time, even if ticket prices go up.

"With so many challenges in handling the summer schedule, we hear that many airlines are not able to provide estimates of their winter schedule yet, so providers are left in the dark as to what they have to provide for."

But handlers are working to mitigate this potential problem. Aviator, for instance, has planned to secure additional staff, equipment and de-icing fluid for winter and to train more staff than usual. While the labour market in the Nordics has been more competitive during the last couple of years and it is difficult to find staff with driving licences for heavy vehicles, Brundin and Lundgren are confident that they have the necessary resources.

"We have been making investments at many of our stations both last season and this season," Brundin and Lundgren observe. "We have been successful during the pandemic and secured some new contracts resulting in higher demand. There have also been replacements of older equipment at some stations."

In Geneva, winter is the high season and dnata is gearing up for a busy few months. Koenig expects traffic in Switzerland to reach about 80-90% of pre-pandemic levels this coming season. That will mean roughly 30% more de-icing operations than those performed during winter 2021-22. Moreover, dnata has won

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a large new contract with easyJet that will double the size of its de-icing operation there from 1 August.

"We're investing in some new vehicles in Geneva to serve the expected growth," Koenig confirms. "We're adding five vehicles, bringing our total fleet there to nine. The new trucks are Vestergaard e-BETA hybrid trucks that can operate for up to three hours with their electric engine; that allows us to de-ice 10-15 aircraft. They are the same model that we've used for the last couple years with conventional thermic engines, so they will integrate smoothly."

dnata will have five parking positions with electric plugs for the new vehicles at Geneva. While its de-icing teams usually use the same communications technology as the rest of the ramp staff, the handler is considering the addition of a separate channel for de-icing in Geneva so as not to overload the existing channel once it starts de-icing for easyJet.

Koenig is "humble and confident" going into the winter season, largely because dnata Switzerland has not had staffing issues, for a couple of reasons. "First, during the pandemic we kept the vast majority of our staff thanks to the government's short-time work scheme. Second, our de-icing pool is expanding, with training due to start in August. Most of the new de-icing staff are internal applicants; the de-icing team is an attractive option for them. These are ramp staff who are already experienced with driving GSE."

Looking further ahead to potential shifts in demand for de-icing equipment and procedures as weather patterns seem to be changing, Brundin and Lundgren say that another challenge for many of Aviator's stations – especially those located in the southern part of Scandinavia – is the warmer winters experienced during the last five years. The outside air temperature has tended to oscillate around 0°C, while there has been precipitation in the form of rain.

"This often results in ice contamination on aircraft surfaces and in some cases also in the formation of clear ice, which is much harder to detect," Brundin and Lundgren observe. "Also, the de-icing treatment in these cases is more demanding since the de-icing operator must first penetrate the ice layer so the heated fluid can heat up the underlying aircraft skin to get rid of the ice.

Enhanced communication helps reduce waste and run-off of costly de-icing fluids; credit: David Clark Company and RDW Group

"After these treatments, a tactile check must be done to ensure the treatment has been efficient since ice can be very hard to detect visually."

Changing weather patterns may lead to a reduction in demand for de-icing, but it will still be necessary to respond to winter weather, as Barsøe points out: "It seems that even if there are fewer de-icing events in many airports, there are more severe winter storms, so the requirements are [still] there."

With average winter temperatures rising while extreme meteorological events are becoming more common, Koenig agrees that, "We need to increase our flexibility – and not cut corners on readiness." ■

New development projects aim at keeping high quality standards but improve on the sustainability aspect

Fabio Caravieri, *Clariant*

Innovation in GSE, part 1: lithium-ion battery technology

GSE power is undergoing a revolution rather than an evolution. Ever more efficient and cost-effective battery technologies are being developed, while new options such as hydrogen fuel cells are also looking like they might be a more than viable alternative in the not too distant future. *Airside* met with a couple of the battery power innovators to understand the value that these new, green options offer

Gerry Hoadley, director of ground support equipment business at Waev Inc, an electric mobility provider established in 2021 to manufacture, distribute, market and support the GEM, Taylor-Dunn and Tiger GSE brands, was directly involved in the development of the fully electric, lithium-ion powered Tiger tow tractor before he joined the Waev team.

He believes that the development of electric vehicles in the GSE space has

reached "a critical tipping point", and notes that airline emission mandates are progressing and lithium power sources can help meet those mandates without sacrificing performance.

Indeed, he opines: "Lithium technology changes the entire game with zero emissions, limited maintenance and a significantly lower total cost of ownership (TCO). We expect to see the broader adoption of lithium-powered GSE, specifically tugs, tractors and burden carriers like our Tiger and Bigfoot Li-ion vehicles. We believe in the value of this technology."

Waev is playing its part in the further advancement of electrification technology for GSE applications by developing fully integrated vehicle solutions and lithium power modules tailored to specific vehicles. "By fully integrating lithium batteries into our power modules and vehicles on the production line, we can optimise the vehicle's operation and maximise the benefits of the technology," Hoadley observes.

"We follow electrification technology closely and partner with suppliers that can help us meet the challenges our customers face. For the launch of our lithium-powered Tiger and Bigfoot vehicles, we identified a battery solution with a very stable chemistry, which provides enhanced safety over other compositions of lithium battery technology."

The Tiger roars

According to Hoadley, "The Tiger Li-ion vehicle offers uncompromised range, towing and hauling, and has familiar user controls for an easy operation with all the benefits of electrification."

In comparison to a diesel vehicle: "There is virtually no difference for operators themselves, while the operation as a whole reaps the benefits of zero emissions, zero fuel expenses, limited maintenance and a significantly lower total cost of ownership. This brings unprecedented value to the GSE market."

And Hoadley believes that the transition to electric GSE is now so much easier than it was in the past. "Traditional barriers to adopting electrification in GSE have now been eliminated," he says. "Tiger Li-ion tow tractors don't require special charging infrastructure; drivers don't need to be retrained on the operation of an entirely new vehicle; and the day-to-day operation schedule isn't restricted by inconvenient charging times.

"Lithium-powered vehicles can be 'opportunity charged' – meaning topped up anytime – or fully discharged without damaging the life of the vehicle. The batteries themselves have the capacity for a full day of operation and the familiarity and similarities between Tiger tugs and traditional diesel-powered tugs helps in the transition to all-electric GSE."

Is hydrogen fuel cell technology a viable alternative to Li-ion? Well, not today, Hoadley suggests. "We've been manufacturing electric vehicles for more than 70 years and we have a deep understanding of the needs and requirements of industrial and commercial applications, and we won't repower a vehicle with the latest and greatest technology unless it provides our customers with significant advantages. We don't see that currently out of hydrogen, but that's not to say it couldn't get there."

He continues: "Our customers have the same mentality – they aren't going to switch to lithium-powered tugs, tow tractors and burden carriers if there isn't real value."

The Tiger and Bigfoot Li-ion tug, tow tractors and burden carriers fully integrate the latest lithium technology, and thereby offer customers increased sustainability, enhanced safety, extended battery life and health, options for charging (standard 110V outlet, on-board charging and off-board fast-charging), zero battery maintenance, extended range and efficiency for all-day and multi-day operation, cold-weather capability and a lower total cost of ownership – pretty much everything they might need, Hoadley would argue.

"Li-ion vehicles save time and money because there aren't ongoing costs – routine maintenance, install

Questions to ask when evaluating Li-ion

Waev Inc is keen to encourage GSE fleet operators and managers to think critically about whether their operations would benefit from a migration to electric equipment. "We also want to help them understand the differences between electric options, and even the difference between various lithium-powered solutions," says Hoadley.

He believes that there are a number of specific questions that a GSE operator should ask when thinking about making the switch to electric GSE in general and lithium-powered units in particular. These questions might include:

- How will the performance of a battery-powered vehicle compare to a similar diesel-powered vehicle? Will it be able to tow/haul the same amount, for example? Will the vehicle be operable all day?
- Will a change to lithium vehicles require significant investment in charging infrastructure? If so, could that be done in phases?
- How long and how often will the vehicle need to be charged? Will there be options for on and off-board charging? Will there be the ability to 'opportunity charge' without damaging the battery?
- How complex will the drive system and battery be and will they require a lot of maintenance? Will the battery have a separate/integrated heated and cooling system to maintain?
- What, if any, additional operator training will be required?
- What will be the ongoing fuel and power train maintenance costs?
- Will electrifying the vehicle bring any additional safety benefits?
- How will the batteries perform in cold and hot weather?
- How many years will the batteries last?
- Will the warranty be the same as for diesel-powered vehicles? ■

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labour, annual battery replacements or opportunity costs. GSE customers that purchase Tiger Li-ion tow tractors could see annual savings of up to 80% compared to traditional fuel tractors. And GSE customers purchasing Bigfoot Li-ion burden carriers could see more than US$10,000 in battery lifetime savings.

"For GSE operators looking to maximise their uptime, lower TCO and improve ROI [return on investment], lithium is the optimal choice," he concludes.

Green Cubes Technology: safe and reliable Li-ion solutions

Hoadley explains that Waev "specifically selected a chemistry (LiFePO4) that is stable, making it inherently safer; it also doesn't need to be heated or cooled to maintain its stability so the vehicle as a whole is simplified".

Other alternatives are available though, just as there are electric battery options other than Li-ion. US-based Green Cubes Technology designs and develops safe and reliable lithium-based electrification solutions for a range of industrial applications; it, too, is a fan of LiFePO4.

Within the aviation sector, it offers lithium-based power systems for GSE as an alternative to both diesel engines and lead acid battery systems. Jerry Crump, the company's director of business development for GSE, explains that in relation to the electrification of GSE, there are currently two competing battery types: the more traditional lead acid option and Li-ion options.

Li-ion batteries rely on lithium nickel manganese cobalt (known as NMC) chemistry or lithium iron phosphate (LFP) chemistry. The latter is synonymous with LiFePO4. NMC has better energy density (being of lighter weight, smaller size and having long runtimes), while LiFePO4/LFP has longer cycle life, higher power delivery and better safety, he says.

But LFP is the best match of attributes for GSE because it is extremely safe for ramp operations and does not require any specialised procedures or safety equipment, Crump opines. And it is LFP Li-ion that Green Cubes offers to the GSE market.

Most GSE applications were already designed to have a certain weight associated with lead acid batteries or an internal combustion engine, so having a battery that is a little heavier does not hurt the design as much as it would for an electric car, he asserts. In fact, in some applications ballast is either added to the LFP battery or the vehicle to ensure that the vehicle has the proper weight.

Lead acid was the lead-in product for eGSE, and is still a viable technology, he believes, despite the many drawbacks it has compared to LFP. Hybrid systems can also be found in many markets. Plus, hydrogen fuel cells have been marketed to GSE suppliers or operators for many years, but – says Crump – there is no readily available infrastructure yet to support this alternative, so the up-front cost is generally high.

"Very long term, we expect a mix of fuel

Green Cubes Technology's SAFEflex family of products

By fully integrating lithium batteries into our power modules and vehicles on the production line, we can optimise the vehicle's operation and maximise the benefits of the technology

Gerry Hoadley,
Waev Inc

The challenges that we face on the ramp are similar for every airport. Most of these challenges revolve around making infrastructure available that meets the needs of the operation

Jerry Crump,
Green Cubes Technology

cells and Li-ion batteries, in the same way that lead acid and internal combustion engines have complemented each other. LFP is less common than NMC, but it is not an immature or rare chemistry. In countries that are further along in the adoption of Li-ion, LFP is often used in large motive applications like electric buses.

"We guide our cell suppliers on the unique requirements of GSE equipment, since the formulation and design of the cell can be manipulated for improved performance – temperature ranges and power output, for example," Crump confirms.

The challenges of using Li-ion for GSE apron operations

"The challenges that we face on the ramp are similar for every airport," says Crump. "Most of these challenges revolve around making infrastructure available that meets the needs of the operation. LFP helps to solve that challenge by allowing

A Tiger Li-Ion tractor ready to go

high rates of fast charging, and the ability to use more of the rated capacity without voltage drop-off."

LFP has a very flat voltage curve, allowing eGSE to operate almost to full depletion before a performance decline is experienced, he says. This allows for the same performance of the eGSE even if the state of charge is as low as 10%. LFP-powered eGSE can run longer and LFP also has a greater ability to discharge current without a change in voltage for applications that are power-intensive, such as lifting cargo or starting the movement of an aircraft in a pushback operation. This allows for batteries that can be sized based upon the runtime, rather than having to be oversized to allow for high power spikes, Crump suggests.

As for the relative cost and economic value of Li-ion, there are several things to take into consideration when looking at LFP costs. While the upfront investment in an LFP battery is more than that of a lead acid battery, the former has double the life expectancy compared to the latter, he says, thereby making the TCO of an LFP battery actually much less than that of a lead acid one.

LFP batteries are also the closest option available today for a maintenance-free battery in GSE, Crump continues. It is not always easy to track the cost of a lead acid battery's maintenance through its life cycle, since it is not uncommon for different personnel to be assigned the tasks of watering and other maintenance functions. Moreover, sometimes a lead acid battery will be sent out for cell replacement, and that cost can be lost in the GSE operational costs.

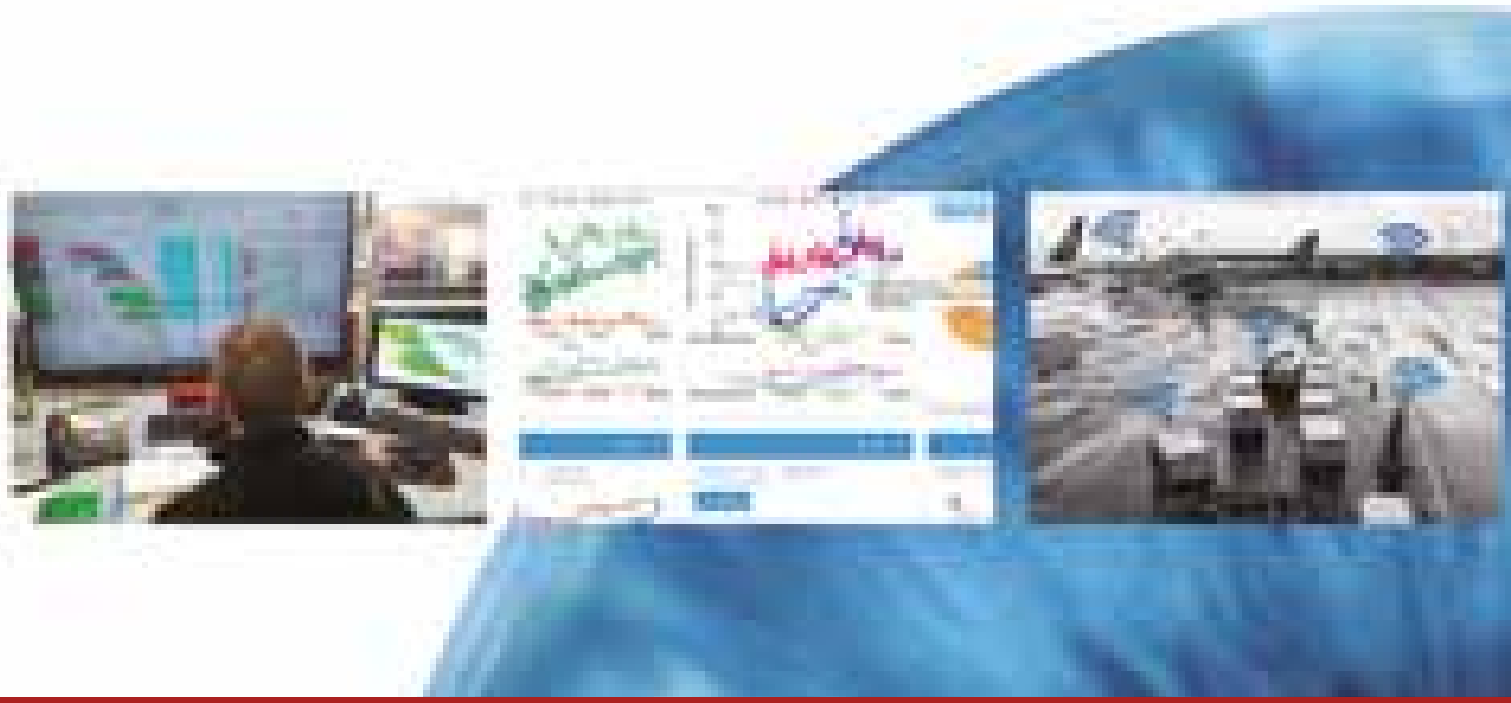
"All of these costs must be factored into the TCO," Crump observes. Other costs that can be associated with LFP revolve around the application of the equipment powered by battery technology. If the GSE asset was designed around lead acid, it might be necessary to add ballast into the battery or into the GSE asset to ensure that the equipment is able to meet its design requirements.

Weight has energy consumption implications, as well as creating wear and tear on items such as tyres and suspension, so a lighter battery without the need for ballast would always be the preference. Another advantage of LFP is that it has a higher discharge rate than lead acid, Crump points out, so LFP does not generate as much heat in the electrical system as lead acid performing the same operation.

This can cause less wear and tear on the electrical system, and increase component longevity.

Green Cubes Technology has sold LFP batteries to numerous GSE user customers, as well as original equipment manufacturers (OEMs). Says Crump: "As we see LFP as the best option for powering eGSE, we are marketing our products to every customer: whether they are an OEM looking to develop new GSE or repowering a formerly designed lead acid GSE design, or a fleet manager looking to increase uptime and reliability in their fleet while lowering operating costs.

"These applications can include full CAN [controlled area network] integration or just a lead acid replacement with our battery gauge installed in place of the former lead acid gauge." ■



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Innovation in GSE, part 2: hydrogen fuel cell technology

While lithium-ion batteries are becoming ever more popular as a greener power source for GSE, other even more revolutionary technologies may well start to make a significant impact. One such is hydrogen cell fuel technology

Jacobs is a global consultancy company aiming to "make the world smarter, more connected and more sustainable", and with those points in mind it has developed a roadmap for airports to become 'hydrogen ready' – to prepare for the day when hydrogen fuel cell technology can be used to power aircraft and the GSE that supports them.

The roadmap, entitled 'Airports as Catalysts for Decarbonisation', builds on the company's work for the Aerospace Technology Institute's FlyZero report called 'Airports, Airlines and Airspace – Operations and Hydrogen Infrastructure'.

Led by the Cranfield University-based Aerospace Technology Institute (ATI) and backed by the UK Government, FlyZero was launched in early 2021 as an intensive research project investigating potential for zero-carbon emission commercial flight. The independent study has brought

together experts from across the UK to assess the design challenges, manufacturing demands, operational requirements and market opportunities of potential zero-carbon emission aircraft concepts.

FlyZero has concluded that liquid hydrogen is the most viable zero-carbon emission fuel, with the potential to scale to larger aircraft utilising fuel cell, gas turbine and hybrid systems. This has guided the focus, conclusions and recommendations of the project.

The Airports, Airlines and Airspace – Operations and Hydrogen Infrastructure report published earlier this year forms part of a suite of FlyZero outputs which will – it is hoped – help "shape the future of global aviation with the intention of gearing up the UK to stand at the forefront of sustainable flight in design, manufacture, technology and skills for years to come".

Based in good part on its work with the ATI and FlyZero, Jacobs' own roadmap has studied how airports can go about introducing the necessary hydrogen infrastructure and considers that powering GSE with hydrogen is an excellent place to begin.

Jacobs has identified three scenarios for the supply and storage of hydrogen at air gateways: the delivery of liquid hydrogen directly to an airport by truck; the use of a hydrogen gas pipeline with on-site liquefaction; or the use of electrolysis for hydrogen production on site at airports.

All methods would require the installation of some new infrastructure at a gateway and would involve the handling of new technologies. Liquid hydrogen (which offers far higher energy density than normal gaseous or compressed hydrogen) must be kept at extremely low temperatures – somewhere in the region of below minus 250 degrees Centigrade – in specially insulated cryogenic tanks.

Thus, notes Ian Sutherland, Jacobs' senior project manager – energy transition and hydrogen, there are certainly challenges relating to storage and distribution. Nevertheless, the advantages of hydrogen are many and the challenges can be overcome with the right infrastructure and processes in place.

The challenges and potential benefits would differ according to the airport in question. Larger and more complex airports would have to involve more parties in the transition process (not only regulators and airlines but ground service providers and other interested suppliers and partners), while it seems unlikely – for the moment anyway – that hydrogen will be a viable power source for widebodied, long-range flights.

However, just about all gateways, large and small, are being asked to reign in their harmful emissions. The International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA) are amongst the industry bodies that have called for the aviation industry to operate with net-zero

carbon emissions by 2050, and it will take a huge effort on the part of airports as well as all the other elements of the aviation industry if that target is to be achieved.

While the use of sustainable aviation fuel (SAF) is gaining momentum and there is plenty of potential in this resource, SAF is "lower emission" while hydrogen is "no emission", Sutherland points out.

Moreover, while it may be argued that larger gateways are likely to have greater access to the finance necessary to make the transition to hydrogen, all have struggled as a result of the pandemic and all are likely to have little money to spare for the foreseeable future.

But, says Andrew Gibson, Jacobs' global solutions director for aviation, we are not talking about making the switch to hydrogen tomorrow. This will be a long-term process, he advises, and one that is more about "safeguarding the future" than making an instant revolution.

***Andrew Gibson,** global solutions director for aviation at Jacobs*

***Ian Sutherland,** senior project manager – energy transition and hydrogen at Jacobs*

Low-hanging fruit

One of the beauties of hydrogen fuel cell technology is that it can be used in "multiple applications" as a power source and, Sutherland asks, where would be the "low-hanging fruit"? Where would it be easiest and best to start in terms of the aviation industry? Using hydrogen to power GSE is his answer, not least because these vehicles operate in the constrained and regulated environment of an airport ramp area and are operated by a fairly limited number of handlers, making the transition that much simpler.

Using hydrogen to power GSE would offer a proof of concept, illustrate its viability for on-airport use, he points out, before it could be adopted as a power source for aircraft. It would be "an entry point that could then be broadened out [to aircraft]."

Or, as the report itself remarks: "Undertaking early adoption of hydrogen will create momentum to implement the significant infrastructure that will be needed to support the operation of hydrogen-fuelled aircraft."

Landside vehicles such as terminal buses could be powered by hydrogen fuel cells, Gibson points out, concurring with Sutherland that using hydrogen for such vehicles would get those involved accustomed to using cryogenic materials and so prepare them for more widespread use of liquid hydrogen in the future – while also helping the environment immediately.

A further step up would be to power airside vehicles such as apron-based GSE with hydrogen. This would involve a slightly higher degree of complexity because it would involve more equipment operators – be they self-handling airlines or independent handlers.

Airport authorities could encourage, perhaps financially, handlers to switch to hydrogen if the appropriate infrastructure and resources were put in place, just as so many have incentivised – or even mandated – ground service providers to switch to electric power for GSE.

There is no diminution in performance for hydrogen fuel cell-powered GSE compared to their diesel peers, Sutherland informs. Indeed, as with battery-powered GSE, the physics involved often means greater torque is available, very useful for the bigger load-bearing equipment such as pushbacks.

Indeed, all the advantages of battery-powered GSE in comparison to diesel equipment apply equally to hydrogen-powered GSE, he points out. The process of creating power is not too dissimilar: in one case, liquid hydrogen is passed through a fuel cell to create electrical energy that provides power/drive to the GSE, while in the other lithium or lead-acid chemistry is used to create electrical power within the battery.

But, Sutherland and Gibson note, there are advantages to hydrogen over rechargeable batteries: huge banks of chargers are unnecessary; it is much quicker to refill with hydrogen than recharge a battery (it takes about the same time as filling a diesel unit with fuel); while hydrogen can also be used to provide power for applications such as

heating or cooling terminal buildings.

Batteries can also perform less well in extreme temperatures, unlike liquid hydrogen; and batteries are expensive, have a fairly finite lifecycle and are difficult to recycle, whereas hydrogen fuel cells can be taken apart and refurbished before being put back into operation if performance does deteriorate.

Demystifying

Demystifying hydrogen fuel cell technology will be an important part of the process of encouraging the use of the technology in the aviation industry, whether for powering commercial aircraft or GSE, Gibson suggests.

But both he and Sutherland are convinced that the move to hydrogen-powered GSE is possible within the next decade, even if regularly powering aircraft on commercial flights through liquid hydrogen fuel cells might be further off.

In the short-term, hydrogen for powering GSE and other ground-based airport mobility and utility applications could be delivered by truck, as a liquid. "This would support the case for an airport to construct liquid hydrogen storage and gaseous refuelling facilities," the Jacobs roadmap, Airports as Catalysts for Decarbonisation, says.

The cost of transport fuel in this method would be low in comparison to other scenarios, thereby making hydrogen as accessible as possible. Then, as hydrogen-powered aircraft are introduced and demand for liquid hydrogen as an aircraft fuel increases, the focus would shift towards building large-scale liquefaction and storage systems, and hydrant pipe networks for refuelling.

There are already hydrogen-powered cars on the road, as there are some buses and trucks. And the potential for hydrogen as a power source for aircraft and/or GSE is certainly being investigated today by various gateways. By way of example, the UK's Bristol Airport is undertaking research and development (R&D) into the possibility of powering GSE by hydrogen as a prelude to low-cost carrier easyJet's ambition to fly hydrogen-powered aircraft through the gateway if and when it is commercially feasible to do so.

And, across the Atlantic, Hydra Energy is to offer low-carbon hydrogen as complementary fuel for diesel vehicles operating airside at Edmonton International Airport (EIA) in Canada (https://www.airsideint.com/issue-article/hydrogen-offers-an-alternative-to-simple-diesel-at-edmonton/).

The Jacobs roadmap concludes: "Hydrogen, as a versatile zero emission fuel, could be the core component around which the decarbonisation of the aviation [industry] is implemented, by incrementally building the hydrogen supply and distribution infrastructure from a short-term starting point."

We will see. ■

Innovation in GSE, part 3: baggage/cargo handling

A new product designed to ease the burden of baggage and cargo handlers is now available on the market: a compact, motorised folding conveyor system that is positioned inside an aircraft belly and mechanically moves baggage or cargo up or down the hold

The conveyor is the brainchild of Tim Fulton, founder and CEO of Ramper Innovations. His company – dedicated to designing equipment that makes aircraft loading and unloading "safer, easier and more efficient" – is based in Sitka, Alaska, where Fulton lives.

The product is called TISABAS, the name based on the challenge and the premise that 'TIm SAves BAckS'. Its main purpose is to ease the task of baggage and cargo loaders who otherwise have

to throw or push loads up and down the belly of an aircraft during the loading/unloading process. Saving on human labour is far from its only benefit, however – of which more later.

Fulton, who has been in Sitka since 1989, worked for 38 years as an Alaska Airlines ramp agent. He spent much of that time loading and unloading heavy boxes of frozen fish, so he knows plenty about the physical challenges of the job. He retired from the carrier, he says, in order to pursue his dream of making the business safer.

In particular, he wanted to design equipment that would ease the task of ramp agents undertaking work that not only puts severe strain on their backs but also impacts on knees and other parts of their body as they move heavy weights within the cramped confines of a narrowbody aircraft cargo hold.

His first shot at the problem resulted in a mechanical roller system that was designed in particular to help make it easier to move heavy consignments of fish. And indeed this proved popular with Alaska Airlines, which purchased 15 units in 2014.

Handlers' interest was also piqued. Menzies Aviation, for example, looked at the system to see if it could help with baggage handling, but here it was found wanting.

So, when Fulton left Alaska Airlines in 2018 he was looking for a solution that would be ideal for moving baggage as well as cargo such as commercial fish. The answer, he thought, lay in a battery-powered, motorised, roller-based based conveyor that would be portable but robust.

TISABAS, was Fulton, says, "designed from the ground up". When extended, the conveyor is 6.1m long, 61cm wide and just 7.6cm high. Folded, it is 60.9cm by 53.3cm by 81.3cm high. It weighs in at 90.7kg.

Powered by a 24V battery, the system is convertible from 14V by the use of a converter that can be attached to a regular belt loader (which normally runs off 14V). It has two speed settings that can handle either 16 or about 23 bags a minute; it can bear weights of up to 150 pounds per square foot, and is operable in temperatures ranging from -29ºC to +49ºC.

***Tim Fulton,** founder and CEO of Ramper Innovations*

For baggage or cargo unloading, TISABAS is placed on a regular belt loader. When the belt loader pulls up to

TISABAS helping to move a lot of soda cans!

an aircraft, TISABAS is moved inside the aircraft belly and placed out of the way until such time as it is needed. Sections of the conveyor are then folded out as the agent goes further back into the belly. The system takes a bag or other load to the aircraft doorway, eliminating the need for the agent to throw any heavy bags or cargo the length of the belly while he or she is on their knees.

TISABAS can be stored in the aircraft belly after the unloading process is completed, positioned ready for the next loading process. For loading, the conveyor's sections are folded up and out of the way as the belly fills. TISABAS then goes back onto the belt loader and is ready for the next flight.

Development

The initial TISABAS proof of concept model was first tested live in June 2018, the unit having been built to Fulton's specifications at a manufacturing facility in Wisconsin. Three units were ordered sometime later but, just as the first conveyors were ready to be shipped to locations as far afield as Japan and India, the Covid-19 pandemic hit, causing havoc in the aviation industry and a retreat from the interest that had been building in the new concept.

Undeterred, Fulton has continued to look for buyers. In May this year, for example, he was at King Salmon Airport in Alaska, working with Alaska Airlines and demonstrating TISABAS. Ramp agents in particular have been very impressed by the system, he says, which he has shown off at industry shows such as the biennial GSE Expo in Las Vegas. He will also be at the new GSE Expo Europe in Paris in September to exhibit TISABAS.

The system has proven its value, Fulton says, in a number of demonstrations, and is ideal for bellyholds such as those of the B737 and A321 families of aircraft. The loading and unloading process for smaller aircraft such as CRJs would also benefit from its use, he believes.

Using TISABAS helps reduce the load of baggage/cargo handlers, as well as lowering the frequency of muscle or skeletal injuries. Clearly, this benefits ramp agents' employers as well as the handlers themselves, not only by minimising days lost through staff being off work and through injury-related insurance/compensation claims, but by making for happier staff – thereby hopefully aiding employee retention and facilitating new recruitment.

TISABAS also enables faster loading and unloading than pure manual effort, and faster turnarounds mean potentially more revenue and profit for operators. Plus, it mitigates the damage to aircraft and baggage/cargo that can result from handlers heaving and throwing heavy loads around inside an aircraft belly.

Moreover, the system is "affordable", is reliable in inclement weather and is simple and quick to deploy. Finally, it was specifically designed as a separate unit from a belt loader, says Fulton, such that if there is any problem with the equipment, it can be quickly removed and the loading/unloading process continued with little impact on turnaround time. ■

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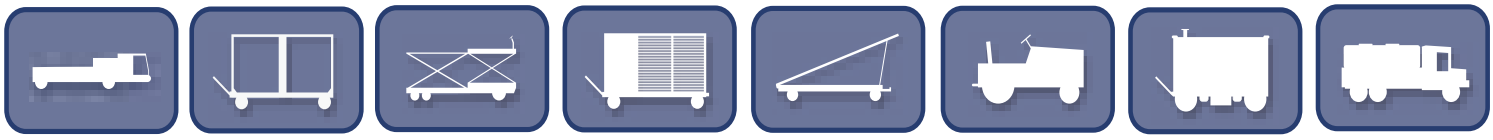

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Moving to electric GSE

Globally active ground services provider (GSP) Swissport has done much to lower its environmental footprint as part of the aviation industry's ongoing efforts to become greener. Its move towards electric GSE represents a key part of its strategy to minimise emissions – as is evident in its Moroccan operations...

Swissport's operations in Morocco date back to 2012, when it won a contract to handle at a number of different airports across the North African nation. Seven years later, it won a tender from the Moroccan airport operator ONDA to handle at no less than 15 stations (namely: Agadir, Al Hoceima, Casablanca, Dakhla, Errachidia, Essaouira, Fès, Laâyoune, Marrakech, Nador, Ouarzazate, Oujda, Rabat, Tangier and Tetouan).

The licence was granted from 1 October 2019 for a period of seven years and was extended by 18 months in response to the Covid pandemic.

At the time, Christophe de Figueiredo, then CEO of Swissport Morocco, promised: "At our Moroccan locations, we will continue to invest in highly trained staff and deploy state-of-the-art equipment, many of which will be electrically powered to further improve our carbon footprint."

And Luzius Wirth, then executive vice president Europe, Middle East & Africa at

Swissport International, added: "Morocco is of great importance for us. Our commitment is reflected in our sizeable deployment of state-of-the-art electric GSE in Morocco."

The GSP stated that it would invest more than 200 million Moroccan Dirhams (US$20.7 million) to renew its GSE fleet in Morocco and would, for example, by 2021 have converted the majority of its GSE at Marrakech to electric drive.

Swissport has kept its word. Idriss Bounou, Swissport's head of fleet in Morocco, confirms that the handler has indeed spent that money and says that as of today it has significant numbers of electric GSE units in operation at eight out of its 15 Moroccan stations.

A total of 366 brand new motorised units of GSE of various types and models has joined the handler's Moroccan fleet since 2019 and, of that figure, 91 units have been battery-powered. That latter figure breaks down as follows:

- 23 sets of passenger stairs, a mix of powered and non-powered, acquired from TLD and TBD
- 37 baggage tractors, acquired from Charlatte Manutention
- 20 conveyor belts, acquired from Charlatte
- 10 passenger buses acquired from Yutong
- 1 towbarless electric pushback, acquired from TLD

The performance of the electric GSE has been more than up to scratch, Bounou observes, thanks in no small part he says, to the efficiency of Swissport International and its Morocco team for ensuring smooth delivery of the equipment.

"We have a good relationship with all the suppliers," Bounou confirms. "They have offered good after-sales support when any problem has developed and were keen to provide five-star customer satisfaction. Moreover, we can't deny the

great effort made by our maintenance provider Airport Global Services (AGS) to ensure equipment is safe and reliable."

Bounou has received what he describes as "really positive feedback" from Swissport handlers operating the new eGSE, who have pointed to a number of significant benefits, including the greatly reduced noise level that not only makes life on the ramp more pleasant when operating the equipment but also makes communication easier – reducing the risk of injury and improving efficiency of operations on the apron. "That's a win-win," he says.

The battery-powered GSE is easy to use, operators report, and does not require complex training. Plus, of course, the environmental benefits of electric GSE are perhaps the most obvious. Unlike diesel-powered equipment, electric GSE does not burn fuel and is therefore emission-free at the point of use.

Swissport has plans to further expand the amount of eGSE it has in place in Morocco; the likelihood is that most of the new eGSE will be baggage tractors, conveyor belts and passenger stairs.

Global effort

In 2019, Swissport declared its intention to have at least half of the GSE in its global inventory powered by electric means. That target may well have taken a hit because of the impact of the pandemic on both the handler directly and of course the wider aviation industry, but Swissport still has big plans for greener GSE.

We have a good relationship with all the suppliers

Idriss Bounou, *Swissport*

In 2020, 14.6% of the handler's global GSE fleet was electric; the proportion in Morocco was much higher.

Part of the success that Swissport has achieved in Morocco in converting to electric has been thanks to its successful collaboration with ONDA there. That co-operation has extended to both parties taking responsibility for providing the electrical infrastructure needed to support large fleets of eGSE. Swissport has committed to caring for that infrastructure wherever it is in place and has also worked with ONDA to bring in infrastructure as and where required.

For example, at its two busiest Moroccan stations – Marrakech and Casablanca – Swissport is installing its own power stations, because the infrastructure currently in place is not ideal for supporting large numbers of electric vehicles waiting to plug in to recharge.

Morocco's example is illustrative of what can be achieved when a handler such as Swissport, working together with airport authorities, is determined to move towards the day when perhaps all GSE will be electric. ■

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An EINSA belt conveyor serves a Binter Canarias aircraft; Binter Canarias is the flag-carrier of the Canary Islands

EINSA: a worldwide presence

David Ayala Galán is the managing director of Madrid, Spain-headquartered EINSA. He explains how the company continues to build on many years of success offering a comprehensive range of GSE into the global civil and military aviation markets

How has EINSA evolved since its establishment over four decades ago?

EINSA is a Spanish company that was founded in 1979 and now has more than 40 years' experience in the aviation industry. During this time, it has established itself as a leader in the design, development, manufacture, installation and support (including maintenance and upgrading) of the most technologically advanced military and civil GSE.

Over this period of time we have supplied our worldwide customer base with a complete range of equipment, all of which is designed to make operations more efficient at airports and air and naval bases. The wide range of equipment developed and manufactured by EINSA, as well as our vast experience, makes us the only company in the world that can provide integral turnkey solutions for all GSE needed at any military air base or civil airport or by any carrier.

These solutions offer a high degree of commonality of components, technologies and engineering solutions across every piece of equipment, meaning important savings for our customers in terms of logistics and life-cycle costs. Moreover, EINSA has the capacity and the experience to provide solutions for any specific requirement our customers may have at any given time.

Apart from your headquarters in Madrid, do you have any other manufacturing or maintenance/ repair facilities elsewhere?
EINSA's facilities are located in Madrid, very near Barajas Airport. All equipment is designed, developed and manufactured in these facilities.

EINSA has two subsidiary companies to support our businesses in the UK and the US. EINSA UK was founded 17 years ago to assist with a contractor logistic support contract awarded to EINSA for the maintenance of the RAF weapon loaders fleet. EINSA US was founded to support EINSA's participation in the F-35 [Lightning fighter] programme.

How many people does EINSA employ?
Altogether, approximately 150 employees are working for EINSA today. Roughly half of our workforce directly manufactures our products and more than a third of the workforce consists of engineers and technicians. That is why we usually like to define ourselves as an engineering company with production capacity.

Can you tell us about the products your workforce manufacture?
EINSA has a wide range of products and our GSE is in operation in more than 60 countries with over 100 customers worldwide. Among the civil equipment which EINSA manufactures, we can highlight the following: passenger stairs, conveyor belts, container loaders, electrical power and hydraulic power supply vehicles (ground power units, or GPUs, and HGPUs), push/pull tow tractors, container/pallet cargo transporters, handling equipment for aircraft and helicopters, servicing equipment and refuellers.

In the military market, we can offer: external weapon loaders, air transportable 'K' loaders, multi-role tactical vehicles, GPUs and HGPUs, push/pull tow tractors, container/pallet cargo transporters, handling equipment for aircraft and helicopters, and refuellers.

Can you tell us about your customer base?
EINSA exports more than 95% of its products and international companies are our main customers. In recent years, [German airport operator] Fraport has become one of the most important customers for EINSA in the civil market – we have supplied passenger stairs and tractors to Fraport for Frankfurt Airport. Moreover, customers like [Spanish national flag-carrier] Iberia, [GSE rental specialist] TCR and [Portuguese handler] Groundforce are longstanding customers.

And in the military market?
EINSA has actively participated in some of the most advanced domestic and

These EINSA passenger stairs are in use with Fraport

international defence and aeronautical programmes of our times, including the Eurofighter programme, the F-35 programme, the A400M and C-295 programmes, the MRTT [Multi Role Tanker Transport] programme and the Tiger and NH90 helicopter programmes, delivering equipment not only to some of the most important aeronautical companies such as BAE, Airbus and Leonardo, but also to many air forces around the world. These include the Canadian Air Force, the German Air Force, the Finnish Air Force and the Italian Air Force, to mention just a few.

EINSA has also been selected by Lockheed Martin to be the official supplier in Europe of the weapon loader for its F-35 programme.

Is your customer base growing, post-pandemic?

Fortunately, during the pandemic, EINSA was able to continue to provide normal production by taking the safety measures recommended by the relevant public authorities. The German Air Force and Canadian Air Force contracts for military ground support equipment and the framework contract with Fraport for passenger steps and tractors were primary responsibilities during this period.

Following the pandemic, airport activity has started again, and we have seen new demand for equipment in this summer period.

In addition, national tenders have been launched for handling licences at Spanish airports, so we expect orders from different customers to supply new equipment for those gaining these new licences.

Have you expanded or improved your products recently in any way?

EINSA equipment is continuously being improved. EINSA is a design authority and has the technical independence to update and redesign its products to comply with the latest international standards and requirements.

Plus, EINSA is increasingly offering electric versions for GSE to meet zero emission requirements of airport authorities. For example, EINSA will be showcasing its new model of electric pallet/container transporter, the TEA-15, at the GSE Expo Europe in Paris in September. Based on our TDA-15 diesel conveyor, this 100% electric equipment has been designed to transport and transfer containerised and palletised loads of up to 7 tonnes to and from container/pallet loaders, trolleys and racks.

Elsewhere, EINSA has developed his own anti-collision system in accordance with IATA AHM 913 [the International Air Transport Association's Airport Handling Manual standard relating to collision avoidance on airport ramps]. We offer a staggered solution to allow the customer to define the level of protection to include in the equipment, from basic protection to the full protection according to AHM 913.

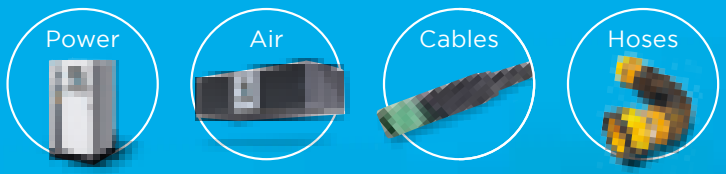
Do you have plans to further add to your GSE product lines?

Yes, we do. In line with our policy of continuous improvement, EINSA has expanded its wide range of products and we have developed a new container loader that is totally electric. This new model, the SELT 7000, will – like the TEA-15 – be exhibited at the GSE Expo in Paris. This electric equipment is a single platform container loader that can lift, lower and transport LD-2/3 containers of up to 7 tonnes.

Have you identified any particular changes in the market that are affecting your business and the sort of GSE you might develop?

As we mentioned above, EINSA offers an electric version for the majority of our equipment types, since we think electric-powered equipment is what our customers will require more and more. Furthermore, we are currently developing hydrogen fuel cell power options such that we will soon be able to offer a new zero emissions solution to our customers. ■

ITW GSE



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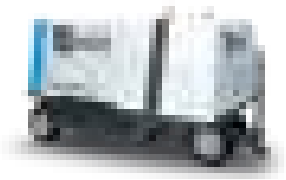

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Moving with the times

Miles GSE is a Turkish supplier of various types of ground support equipment. Sales & marketing supervisor Engin Dogan tells *Airside* all about the manufacturer, its background and its plans for the future

Miles GSE was established as part of the Miles Makine Group; what is its role within that Group?

Miles GSE was founded in 1991, and started life supplying ground support equipment to ground handlers.

In the beginning, Miles GSE primarily manufactured truck-mounted units, but as time went on we improved ourselves: today, Miles GSE manufactures self-propelled units as well as electric GSE.

We not only focus on manufacturing and developing high-performing products but we also focus on the reliability and safety aspects of our products.

Headquartered in Istanbul and Bremen, is all your manufacturing undertaken at your factory in Istanbul?

Business/executive-related work as well as product assembly operations is undertaken in Istanbul and Bremen, while manufacturing takes place at our Istanbul and Sakarya factories, which have a total production area of 29,300m^2.

While our Istanbul office takes care of the Middle East and Asian markets, our new Bremen office will cater to the European and the Americas markets. This new location will help our clients and us to resolve together any on-site issues that they may face and, needless to say, it is going to

help our customers receive answers faster and closer to where they are in Europe.

Thanks to the Turkish aviation industry, particularly Turkish Airlines, we are collaborating with many international aviation service providers, such as [catering company] Do&Co. We have supplied more than 200 units of Miles 5011 catering trucks to Turkish Do&Co alone (Turkish Do&Co is owned by Turkish Airlines and Do&Co).

We have been delivering the same product all around the world since 2010.

How many people does Miles GSE currently employ?

Before the pandemic hit the whole world, we had nearly 200 employees, but due to the unfortunate events that we have all gone through, we had to reduce that number to a little bit more than 150.

However, as the sector and we are now getting back on our feet, the staff complement has risen back to around 180. We are aiming to grow further and we believe that having a strong team is necessary for the achievements that we are planning.

Can you tell us more about your product portfolio?

Although our flagship products are our catering trucks, ambulifts and toilet service trucks, we also manufacture and get really good feedback relating to our baggage tractor (the Volta 25) and we have lots of solutions for apron mobility (including aircraft recovery systems), while we also offer maintenance platforms, both towable and truck-mounted.

We have a wide range of innovative solutions for serving aircraft, such as seat transfer trucks [that enable maintenance crews to change aircraft cabin seats], ladder maintenance trucks and aircraft tyre transfer trucks, all of which were designed and manufactured by Miles GSE.

We also supply electric GSE, and have been working on our very first pushback

unit since the start of the pandemic, work which we believe will very soon bear fruit.

Have you expanded or improved your products in any way recently?

Yes. For example, we redesigned our ambulift last year, and it has received lots of good feedback from existing customers as well as entirely new ones.

Our products are constantly in the 'R&D phase': we never stop improving our products. At Miles GSE, we always strive for perfection, especially in a specialised sector like aviation.

We have focused on autonomous technology and electric GSE this year, and we believe that this is the future of GSE (though this might not be the case right now for the Middle Eastern and African markets, it soon will be).

Switching from a hydraulic equipment-focused company to an autonomous technology-focused one is not an easy task to complete, but we believe we have been gathering really important milestones along the journey and we are not that far from reaching our goal.

We are also trying to change the 'standards' of the sector. Our Miles Volta 25 baggage tractor comes with heating/cooling/air conditioning and a snow plough attachment as standard, for example.

Has the market evolved in any way in recent years that requires you to change your business model or products?

These years are 'years of change'. The world has never had more divided markets in the same sector as now: while some markets are trying to reach electric GSE and general sustainability goals, others are facing labour problems and a lack of infrastructure for electric GSE. To serve all markets, we are providing solutions for both diesel and electric power as well as both truck-mounted and self-propelled units. One might say that we are trying to be the bridge between both worlds.

I do not believe in luck; I think people create their own luck. Success is not something that can be achieved by doing nothing. At Miles, we are always working hard and providing good service to our customers. When customers leave our offices with a smile on their faces, I feel like we have achieved something. ■

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EULEN America all set to exploit future opportunities

EULEN America provides a range of aviation services at several airports on the US East Coast and in Jamaica (as well as other services outside the sector). While the collapse of the aviation industry caused by the pandemic has of course brought challenges, it believes itself well positioned to benefit hugely from the recovery in the industry we are now seeing

In May, EULEN America was recertified by the International Air Transport Association (IATA) as IATA Safety Audit for Ground Operations (ISAGO) compliant. First certified to ISAGO standard in 2010, the recertification was an important confirmation of the handler's continuing high level of performance despite the impact of the Covid-19 pandemic on business, says Larry Massaro, senior vice president of aviation at EULEN America.

Certification covers compliance with safety standards relating to organisation and management, load control, passenger

and baggage handling, aircraft handling and loading, aircraft ground movements, and cargo and mail handling. Certification is due for renewal in November 2023.

"We are committed to providing the highest level of quality of service and safety standards to our clients," Massaro declares. "This new certification covers all our stations and provides a high standard in terms of safety ... in the services we provide to our clients and employees."

Changing times

Massaro joined EULEN America only comparatively recently, in August last year. He is responsible for contract negotiations and resolving issues to ensure processes, systems, products, regulations and data are delivered seamlessly to all aviation customers, as well as being in charge of day-to-day oversight of EULEN aviation operations, strategic planning, leadership development and employee engagement.

EULEN was founded in 1962. Headquartered in the Spanish capital of Madrid, it has a presence in 14 countries. It offers a range of services including aviation services, cleaning, security and other facilities management services.

The company has been active in the US market for over a decade and has a North America corporate office in Miami, Florida. In the aviation market, it operates at 10 locations on the US eastern seaboard – the biggest of its operations here being at Miami International Airport (MIA) and New York JFK – as well as at two stations in the Caribbean at Kingston and Montego Bay, Jamaica. However, it only ramp handles at five stations – MIA, Tampa International Airport, Fort Myers (all three in Florida), Kingston and Montego Bay. At its other seven stations in the US it variously offers passenger handling or cleaning services.

EULEN America currently has a workforce of approximately 3,000 employees providing services across Florida, New York, New Jersey, Maryland and Washington DC, and it is these people that are the "bedrock" of EULEN America's business, Massaro insists. That is perhaps more the case than it ever was, he believes, given that while the ground handling business has not in itself been changed by the pandemic and consequent crash in the aviation industry, it has led to a change in the "dynamics of recruitment and staff retention".

In other words, it became much harder to retain employees during the downturn and has become harder to recruit new staff now as the industry recovers, because so many handlers have moved to other jobs. It has been a challenge therefore, says Massaro, to win back or replace the workers that had to be laid off during the worst of the pandemic. "It's a very competitive market out there" in terms of attracting new people to the industry, he warns. ■

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As well as enabling optimal use of scarce GSE resources, the system also removes many of the monitoring and decision-making responsibilities from dispatchers and other managers by automating scheduling and instantly flagging up any problems that arise.

XOPS is the brand name of the digital, 'smart' fleet and operations management

system offered by Resonate MP4. Resonate MP4 was established in France as a specialist in digital processing, multimedia systems and 'intelligent transportation' by two brothers, Frédéric and Jean-François Bouilhaguet, the former the technical specialist, the latter bringing many years of experience in airport and airline operations, particularly with Air France.

These two founders were quickly joined by Cristian Spiescu in order to establish, lead and grow the XOPS software development team in Romania.

Together, they created an application for digitising turnaround processes within the aviation industry. The result of that – XOPS – was picked up by various independent ground handlers in France; Air France, the French flag-carrier, remains the platform's biggest user today.

Resonate MP4 really got involved in telematics about a dozen years ago, informs David Read, general manager of Resonate MP4 UK, who has worked with co-founder and current CEO Jean-François since 2015. At that time, the company for which Read worked (which offered services to Heathrow Airport's operator and its ground handlers) was collaborating with Resonate MP4 on a tender for telematics at London Heathrow International Airport – a tender process in which they were successful and for which Resonate MP4 still holds the contract today. Shortly after that, Read moved across to work with Resonate pretty much full time.

XOPS' raw material is the data collected by the telematics element of the system, and this data is "precise down to the metre, reliable and accurate", says Read. It delivers ongoing data including such variables as the speed of a GSE unit, its location, the cargo it is carrying and the maintenance status of the equipment, as well as much more besides. For electric GSE, a growing proportion of the ground service vehicles now working on airport ramps, XOPS also offers detailed data on such things as battery condition, helping for example the system or manual operators to determine and optimise when the next battery charge might be required.

Sitting above the Fleet Management System (FMS) aspect of XOPS is the Operations Management System (OMS), which analyses and interrogates the raw telematics data and, working in sync with the parameters laid down by the system's users (assisted by Resonate MP4), assesses the optimal employment of GSE assets. Thus, for example, it will schedule when and where a particular item of GSE should be picked up by an operator, to which stand it should go, what it should do when it gets there, and where it should be moved for further use or parking after that.

Performance on the ramp is assessed on an ongoing basis against that scheduling and any issues or problems are then

In-vehicle XOPS access control

flagged up by the XOPS platform.

Data is accessible on a real-time basis by any operator that has the necessary clearance (there is hierarchical access permission security built into XOPS that can be set up as required according to customer needs), whether that be an individual GSE ground handler operating a pushback or any other type of GSE, a dispatcher or a fleet manager; an airport authority can also analyse legacy data to assess the performance of ground service providers (GSPs).

Details of GSPs' service level agreements (SLAs) are fed into the XOPS platform, so performance can be measured against those as and when required by an airport operator.

Airport operators can use XOPS to determine how or where GSE assets might be better utilised or, indeed, if all assets are actually needed: is there too much equipment in a fleet? All data can be accessed via any Android device, whether that be PC, laptop, tablet or even smart phone.

Wide-ranging customer base

An obvious potential customer for XOPS is the airport operator. For example, Hong Kong International Airport (HKIA) has used the system to good effect to pool its GSE fleet amongst the four major local handlers and to optimise performance of GSE assets at Terminal 2. Resonate MP4 won that tender in 2018.

Elsewhere, Airport Authority Hong Kong (AA) – which operates HKIA – and the airport's four GSPs all use XOPS on an ongoing basis.

"AA wanted a robust control system" to manage its turnaround operations, says Read. Handlers Jardine Air Terminal Services (JATS), SATS, Hong Kong Airport Services (HAS) and Hong Kong Air Cargo Terminals Ltd (Hactl) share a fleet of more than 600 GSE units and XOPS – as well as its other benefits – allows AA to see which handler is using which units, 24/7, in real time. This enables it to bill the handlers according to their GSE usage, as well as to monitor performance and efficiency in GSE use.

Indeed, "GSE pooling doesn't work without a system such as XOPS," Read believes, while adding: "The example of HKIA really has shown that pooling does have value" when monitored and supervised by an operational management platform like XOPS.

As well as airport operators, other users of the system include airlines, such as the previously mentioned Air France and Ireland's Ryanair, which uses the XOPS FMS capability at more than 30 airports across the UK (including its London Stansted hub), Spain and Poland. Plus, the Saudi Airlines Group chose XOPS for its GSE maintenance joint venture covering more than 20 airports in Saudi Arabia.

Gate Gourmet, the caterer, also uses XOPS, in its case across US and European stations to track its catering truck fleet and optimise its operations.

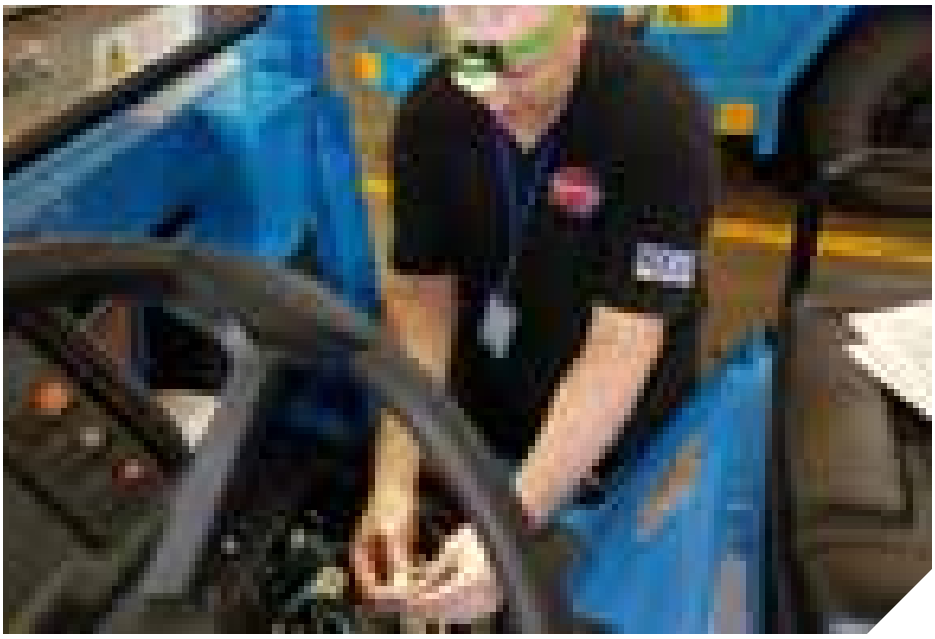
Self-handling airlines are another potential customer base, while some collaboration has also been undertaken by Resonate with Amazon Prime. In essence,

while some smaller enterprises have employed XOPS, it is those that operate in the larger, more complex airside environments that are likely to benefit most from the system, Read considers.

Also likely to benefit greatly are those gateways and GSE operators considering evolving the dynamics of their airside procedures in order to gain efficiencies or, perhaps, to become more environmentally friendly, such that turnaround standard operating procedures and/or GSE fleets are likely to change. Those that are looking to digitise to optimise performance might also well consider the XOPS capability, he stresses.

Upon a client deciding to go with XOPS, it will work with Resonate to jointly programme the software with all the information necessary for the system to deliver its full functionality of monitoring and oversight capability, scheduling and so on.

And the XOPS team provides ongoing support to the customer as its operational procedures and requirements change, with a specific focus today on evolving XOPS to offer new features and functionalities, including integrated video, artificial intelligence (AI) analysis tools and support for driverless vehicles and dark ramps, Read concludes. ■



Retrofit engineering XOPS

Agility snaps up Menzies in deal worth £763 million

Supply chain services provider Agility has completed its acquisition of UK-based John Menzies. The latter will be combined with Agility's Kuwait-headquartered National Aviation Services (NAS) business in a move that will offer aviation services in 58 countries

The new Menzies Aviation will, in fact, be the world's largest aviation services provider, Agility says, in terms of the number of countries in which it operates (today, 58) – and the second largest by the number of airports it serves (today, 254). The deal values

Menzies at £763 million (US$922 million).

Menzies Aviation will offer ground handling services, fuelling and air cargo handling services in a single business that brings together two enterprises that had a combined revenue of more than US$1.5 billion in 2021. It will employ in the region of 35,000 staff.

Client carriers include Air Canada, Air China, Air France-KLM, American Airlines, British Airways (part of Anglo-Spanish concern IAG), Cathay Pacific, EasyJet, Emirates, Ethiopian, flydubai, Frontier Airlines, Jazeera, Qantas, Qatar Airways, Southwest, Turkish, United, WestJet and Wizz Air.

"Menzies and NAS will create the world leader in aviation services," Hassan El-Houry, previously the CEO of NAS and now Menzies Aviation chairman, states.

"We will have the scale and resources to expand and grow as the industry recovers from the Covid-19 pandemic. Commercial aviation is a key engine of global economic growth, and our customers need partners they can count on as flight volumes return," he adds.

Menzies Aviation CEO Philipp Joeinig has retained his position. He promises: "With the combination of Menzies and

NAS, our customers will receive world-class service, expanded product offerings, and the industry's best safety practices at airports on six continents."

Plus, he continues: "Agility's backing gives us the resources to provide innovative solutions for growing and forward-thinking customers, and to develop our talent, technology and sustainability – critical factors for our future success. It also means we are well positioned to support our customers in tackling supply chain challenges and labour shortages."

Agility vice chairman Tarek Sultan adds: "This is a new chapter for Agility, Menzies and NAS. By acquiring Menzies and combining it with NAS, Agility has the opportunity to unlock greater value in both.

"Agility has a strong track record of sustainable and responsible growth over the last two decades, driven both organically and through mergers and acquisitions, and this latest deal is part of our strategy to further accelerate that growth.

"For Agility, this deal creates the largest owned and operated – 'controlled' - business in Agility's portfolio by revenue, headcount, and global presence," Sultan observes.

Careful preparation

The deal has been some time in preparation. Joeinig recalls: "On 21 February we announced to the market that we would be willing to enter discussions with Agility/ NAS and on 30 March we were pleased to announce that we had reached an agreement on the terms of a recommended cash offer to be made by Agility/NAS.

"After that, a number of key milestones had to be met, including securing approval from shareholders and the relevant regulatory authorities. I am pleased that preparations in the lead-up to the deal completion went smoothly and we successfully completed the

transaction on schedule."

And it is certainly a deal that Menzies had been looking forward to. Joeinig tells *Airside*: "We are excited about the future prospects of the combined business. The goal is to be the undisputed number one in the industry and the deal will provide the springboard to accelerate growth in emerging and established aviation markets."

That goal is hopefully to be achieved through the Menzies/NAS combination that gives the new Menzies Aviation a team of "35,000 talented, driven employees, providing air cargo, fuel and ground services at 254 airports in 58 countries on six continents. The new company will use the Menzies Aviation brand name, the oldest and most recognised in the industry, and will be the world's largest aviation services provider by number of countries,' Joeinig declares.

"We are determined to provide seamless, uninterrupted service for our customers. Menzies' expanded global reach and broadened portfolio of services mean more flexibility and options for customers as they look to improve efficiency, safety, sustainability and service quality for their passengers and cargo customers."

Moreover, with Agility's backing, the new Menzies will "have the capital to invest in the talent, technology, infrastructure and sustainability leadership required to be the global aviation services leader", Joeinig adds.

Synergies will, it is hoped be realised sooner rather than later. Says Joeinig: "Now that the deal has been completed, we want to start operating as one unified business as quickly as possible. We are currently developing a full integration plan to combine Menzies and NAS. We anticipate a smooth integration for customers and we are determined to deliver the highest levels of customer service and outstanding operational performance as flight volumes continue to recover." ■

Aviramp's Chair Lifter, also known as the Multi-Lifter

Aviramp all set for better times for the aviation industry

As the aviation sector struggles to return to normality and cope with swiftly recovering passenger numbers, many GSE suppliers are gearing up to meet increased demand for their products. Telford, UK-based Aviramp designs and manufactures a range of mobile boarding ramps that provide a step-free experience for all passengers and an easier boarding and disembarking process for passengers with reduced mobility (PRM)

Terri Smart-Jewkes, Aviramp's global sales and marketing director, says that Aviramp used the downturn in the industry caused by the Covid-19 pandemic as breathing space to prepare the business for better times.

She recalls: "During the pandemic, Aviramp continued to support customers, by listening to specific ground handling challenges, undertaking some due diligence regarding those challenges, and ultimately investing this forced manufacturing downtime into something useful and worthwhile longer term: innovation and product development.

"Aviramp is a natural innovator. It is in the company's DNA," Smart-Jewkes says, adding: "It lies at the heart of what we do. So, our positive response to lockdown and the various restrictions on the industry was to get stuck in to launching our solar-powered range of mobile passenger boarding ramps and bridges.

"This directly answered concerns within the industry relating to sustainability and aviation's environmental mandate. Covid-19 hampered development, and indeed product launch, but this did not deter the Aviramp team.

"We know how much the ground handling sector has embraced our passenger boarding product suite, and its raft of benefits. The industry loves the versatility of this equipment, so to offer a solar version with all the extra advantages seemed to us a 'no-brainer', even though we believe it was interpreted as a brave and groundbreaking move."

All five of Aviramp's ramp models – International, Continental, Domestic, Regional and Lite – are now available in solar-powered variants. Plus, Aviramp also offers a retrofit service to convert customer's existing diesel-powered ramps into energy-efficient solar versions.

The solar-powered units have proved popular – and not just in hot-weather nations. "They are popular in so many markets, including in colder climates such as Norway," Smart-Jewkes informs.

A real first

Aviramp has also brought other new developments to market. "We listened intently and innovated still further, by introducing a real first: our Stretcher Compatible Passenger Boarding product," Smart-Jewkes says. This meets the needs of ground handlers who have been concerned for many years about how to safely, quickly and effectively move stretchered passengers onto and off aircraft, she believes.

Aviramp's modifications to its existing mobile boarding ramps delivered on this, Smart-Jewkes asserts, and the product is now seen as a vital "enabler" for "streamlining boarding and deplaning, whilst reducing delays and managing passenger volumes".

Finally, Aviaramp has also launched a new Multi-Lifter product, which is described as a simple yet ingenious compact product that can transfer heavy items into and out of an aircraft hold. It is ideal for moving heavy wheelchairs and the like.

It represents an improvement on Aviramp's pre-existing Mobiloader product, not least in the extra versatility that the Multi-Lifter offers.

Both the Stretcher Compatible Passenger Boarding equipment and Multi-Lifter were launched earlier this year, following successful trials.

"We also came up with new modifications for various optional extras for our flagship Aviramp passenger boarding product as well," Smart-Jewkes informs. "So, our downtime was wisely spent, with Aviramp responding with new, cost-effective solutions to old problems."

"Moreover, our sister company, Alloy Ramps, a specialist in the manufacture of ramps designed for access and loading, remained very busy during this economically difficult time, servicing the

Aviramp offers a range of solar-powered mobile passenger boarding ramps and bridges

medical supplies and home delivery sectors.

"Again, we innovated here with streamlined folding van and truck ramps, along with swivel versions, for safer, faster and easier loading. This business also thrived on producing bespoke ramp systems for specific industry access requirements in the maritime and rail sectors, amongst others."

Weathering the storm

According to Smart-Jewkes, the fact that Aviramp enjoys strong, open relationships with both customers and influencers within the industry has been key to providing "the insight and advocacy" that enabled the company to "weather the storm" of the pandemic and its impact on the aviation industry.

"Customers were grateful for our speedy responses to servicing equipment and delivering new parts when needed, and although shipping legislation and visa restrictions during this period proved aggravating, we tried to send installation teams and engineers out globally, where we could, to help with customer demand."

Being "present globally and with units in operation pretty much everywhere except India", there is plenty of ground to cover.

Last year also brought a most sought-after recognition: the Queen's Award for exponential growth in export trade. "This was a great honour, and a morale boost for the company, and indeed the industry we represent," Smart-Jewkes remarks.

"Now, the industry is in recovery, and the travel industry is beginning to rebuild. More airports are opening closed terminals and building passenger volumes once again. The world is finally on the move.

"So too at Aviramp: we are also starting to rebuild in terms of enquiries and sales, from both new and existing customers. Being an independently owned manufacturer, we know there is already a great deal of respect and loyalty towards us."

The best possible passenger experience

As a business, Aviramp never forgets its mission and commitment to continue to deliver simply constructed, low-maintenance products, that meet all safety and operational key performance indicators (KPIs), alongside ensuring the best possible passenger experience – particularly for those with reduced mobility, Smart-Jewkes declares.

Aviramp is always mindful of the need for a streamlined and quick aircraft turnaround process, and this underpins its GSE product offering. It has been demonstrated in independent trials at London Gatwick Airport that aircraft turnaround efficiency was "faster by 30%" as a result of using Aviramp equipment, she points out.

"Furthermore, we also offer outstanding cost-effectiveness in comparison with similar GSE offered by our counterparts, and now post-pandemic, cost will feature heavily: more so than ever before. So again, Aviramp stand outs with its product proposition," she says.

"We have always worked closely with customers' operational teams in order to support a fluid ground handling process that is completely customised for them. We can offer as little or as much as the customer determines. Now [with the solar-powered Aviramp variants], we also offer a carbon-free alternative, even more compelling for the industry.

"The Aviramp business and team remain very positive, highly focused, forward thinking and motivated, for whatever the future may bring, with all its endless possibilities to embrace change in this post-pandemic 'new world' of aviation ground handling," Smart-Jewkes concludes. ■

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WheelTug went through its paces with AlbaStar during demonstration testing at Memphis International Airport in the US in September 2020

AlbaStar signs on the dotted line for WheelTug

Amongst the many announcements made at the biennial UK Farnborough International Airshow held in July this year was news that Spanish airline AlbaStar had agreed to be the European launch customer for the innovative WheelTug electric taxiing system

AlbaStar, a Palma de Mallorca-based airline that offers scheduled services but also specialises in specialist charter provision for pilgrims, tour operators, government bodies and even sports organisations as well as flights for passengers with restricted mobility (PRMs), has ordered a number of WheelTug units that will be retrofitted to aircraft of its existing fleet of five B737-800NGs. Delivery is expected in the latter half of 2023.

The deal with WheelTug also includes an option to convert its rights to A220 and/or Boeing MAX aircraft (when these systems become available), should the carrier decide to acquire these aircraft types.

A WheelTug unit, installed on the nose wheel of an aircraft, can drive the aeroplane forward and backward when approaching or leaving a gate.

Using the power of the aircraft's own auxiliary power unit (APU), WheelTug drives the machine either on to or away from a stand, obviating the need for the aircraft's engines to run on power – they can remain on 'idle' – or for a separate pushback tug to be used at that point.

The aircraft's pilot or co-pilot controls the movement of the aircraft from the flight deck. A camera system called WheelTug Vision can be fitted as part of the WheelTug product – as it will be for AlbaStar – to offer the aircrew all-round visibility from near ground level. This is thought to improve overall safety (for example, allowing the flight deck crew to confirm flap settings or cargo door closure), while also reducing the need for wing walkers at a time when ground handling staff levels are at a premium at numerous airports around the world.

The system is said to lower average turnaround times, as well as reducing aircraft fuel burn, minimising engine and

brake wear and significantly lowering pushback costs. There is no jet blast on congested apron areas and noise is significantly reduced too, while in terms of harmful emissions, WheelTug asserts that using the system across the AlbaStar fleet will reduce the airline's combined CO_2 and NOx emissions by as much as 1,000 tonnes a year.

Michael Harrington, the CEO of AlbaStar, stresses the environmental benefits of the system in particular. "For AlbaStar to be the European launch customer of such an important project for cutting CO_2 emissions is a great honor and we very much hope this will set a game-changing example with other European airlines."

As part of the agreement, WheelTug will have the use of an AlbaStar aircraft for system testing, as well as both ground and flight tests for certification purposes. These trials will build on a good teal of testing that AlbaStar has already carried out on the WheelTug system. In mid-September 2020, the WheelTug taxi system was put through its paces at Memphis International Airport by an AlbaStar aircraft. The aircraft tow technology was also shown off publicly for the first time in a live airport environment during the trials.

European launch customer

"Collaborating with AlbaStar in Memphis was such a positive experience that we are all the more pleased to partner with them again, this time as our [European] launch customer," WheelTug CEO Isaiah Cox asserts.

He tells *Airside* that the "great relationship" that has been developed between WheelTug and AlbaStar actually pre-dates the Memphis testing by about six months, back to the early days of the global Covid-19 pandemic, and points out that the aircraft that was used in the trials at Memphis will actually be the official "launch aircraft" for the AlbaStar fleet when it comes to equipping its aeroplanes with WheelTug.

That machine will then become something of an operational, flying demonstrator of the effectiveness of the system.

Prior to operational use, training will be provided to both AlbaStar flight crews and the relevant maintenance personnel who will work with and on the system. This training will likely be browser-based and integrated with airlines' own training programmes. WheelTug is looking to work with one or more specialised training companies in this regard to provide support as necessary.

The deal with AlbaStar adds to the letters of intent (LOIs) that have already been agreed between WheelTug and more than two dozen carriers representing more than 2,000 aircraft that have reserved delivery slot positions.

As well as airlines, Cox and his team are also working closely with airport operators to persuade them of the benefits of the WheelTug system and ensure that they would be comfortable using it at their gateways. Each airport has different procedures agreed with its customer carriers for pushback at its various gates – and there can be lots of them. WheelTug-using airlines will no doubt work with airport authorities to ensure that WheelTug is accepted as an alternative method of pushback, but WheelTug is also collaborating with a number of airports to "get ahead of the game".

For example, Cox informs, the Adani Group, which acquired Indian hub Mumbai International Airport only last year, recently completed a feasibility study on the potential use of WheelTug: the report pointed to a likely improvement in turnaround times as well as other advantages alluded to above.

WheelTug is co-operating with Germany's Paderborn Lippstadt Airport on the role that WheelTug can play in its 'FastGate' strategy and is also working with the Czech Republic's Prague Airport on a WheelTug feasibility study for the gateway.

Meanwhile, WheelTug is working with the Federal Aviation Administration (FAA) to gain certification with the US aviation regulatory body. WheelTug's certification plan has been accepted by the FAA and, all being well, WheelTug

We very much hope this will set a game-changing example with other European airlines

Michael Harrington, *AlbaStar*

can move on to obtaining certification with bodies like the European Aviation Safety Agency (EASA) and relevant bilateral agencies.

It is a very exciting time for the company, Cox says, especially as he is confident of more forward orders for WheelTug slots with other carriers in the near future. ■

New MD of ABM's UK aviation business offers guiding hand

After serving as operations director for the past four years, on 1 June Jim Niblock officially started in his new role as managing director of facilities services provider ABM's aviation business in the UK, as well as head of Blackjack Promotions (a trading division of ABM) in the UK and Ireland. He lays out his current priorities and future plans

What will be your initial priorities as you settle into your new role?

The entire aviation industry will continue to face challenges through the various phases of the pandemic recovery. My initial focus is on guiding the business and supporting our teams as we navigate, find solutions and pivot our operations as needed right now.

For example, we are working to resolve the effects of the national labour and resource shortage through a dedicated recruitment unit we created to minimise, where possible, the length of the onboarding process required to work airside. As a result, we are steadily

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growing our teams towards or meeting head count targets across the business.

This strategy has a longer term view of course, as we strategically rebuild our team toward fuelling our growth in the coming years. Further strengthening our relationships with existing customers, while identifying key opportunities to grow our client portfolio, are key.

From a Blackjack Promotions perspective, we have never lost focus on the creative and engaging experience our team delivers for clients. We continue to focus on the retail offering, while continuing to develop the VIP ambassador product with airlines and airports which has been very successful coming out of the pandemic.

My transition into this role has been made easier by having an excellent team around me who work together and truly care about delivering for our customers, the success of their peers, and the business as a whole.

At ABM, our mission is to 'make a difference', and I am so proud to lead this incredible team who deliver on that mission every single day.

Has ABM's aviation business undergone any restructuring as part of the rebranding from OmniServ?

When OmniServ joined the ABM family [in 2012, although OmniServ was not officially rebranded as ABM until 2020], our focus was to provide a seamless experience for our customers while we worked to integrate our practices and processes, including safety, compliance, customer service and quality control, while also aligning with the ABM culture. Through this, we have maintained consistent operational structure, with minimal to no changes for customers.

ABM is one of the world's largest integrated facility services providers, with over 100,000 team members across the US and the UK, providing comprehensive services that includes janitorial, engineering, parking, electrical and lighting, energy solutions, HVAC [heating, ventilation and air-conditioning] and mechanical, landscape and turf, and mission-critical solutions across multiple industries – including corporate real estate, aviation, education, healthcare, manufacturing and distribution.

As part of ABM, we have stronger operations and resources, with greater scale and efficiencies to meet the evolving needs of clients.

As the aviation industry finally comes out of the profound downturn caused by the pandemic, do you think that ABM is well positioned to take advantage of the upturn in demand for flight services?

We are. During the pandemic we worked with our clients to retain as many staff as possible, keeping the experienced talent and expertise in our business, and we have been able to quickly adjust to the rebound in travel since. I believe that the biggest strength we have is our team, which has shown unbelievable resilience and dedication, and I cannot thank them enough for everything they have done and continue to deliver for our clients every day.

We are hearing of a lot of bottlenecks in the UK aviation sector at the moment, particularly in terms of handling. How is ABM Aviation dealing with any related issues?

Across the UK, we are experiencing a demand above pre-pandemic levels, which on one hand is very welcome news. We want people travelling. The crush is, however, placing a strain on the airport ecosystem. So, we are actively working with our teams, clients and partners to implement efforts to minimise the impact on passengers as we navigate this phase of the pandemic recovery.

The services offered by our teams are part of a larger network of airport services that continues to face challenges, including a national labour and resource shortage.

Specifically, relating to increasing team members on the ground I've already mentioned a dedicated recruitment unit that was created to minimise, where possible, the length of the onboarding process required to work airside. We are

As part of ABM, we have stronger operations and resources, with greater scale and efficiencies to meet the evolving needs of clients

Jim Niblock, ABM

also working with customers on ensuring equipment is fit for purpose to deal with this increasing demand.

Do you think that air services provision has changed for good as a result of the pandemic?

While hygiene and cleaning standards were always high, the new normal in this respect has no doubt been elevated and that is here to stay. During the pandemic, ABM established an Expert Advisory Council, composed of internal and external leading experts in infectious disease and industrial hygiene, to advise on changing best practices, which led to the development of our proprietary EnhancedClean™ and EnhancedFacility™ programmes.

These practices are now a part of our standard offer as we continue to meet and exceed changing expectations on surface cleaning and indoor air quality. Robust auditing systems through which best practice is adopted will continue to ensure standards are industry leading.

How could or should aviation service providers in general and the aviation industry as a whole embrace change as we move out of the pandemic?

I think the key change for the industry, in terms of airlines, airports and handling companies, will lie in adopting a far more collaborative approach: working more closely together than ever before. Within the airport ecosystem, all these providers work together to deliver a seamless experience for passengers. Truly embracing positive and sustainable changes will rely on all the moving parts of our fantastic industry to continue finding ways to reduce obstacles, and increase open communication at all levels. ■

The Air Business GSE guarantee

Paris-based Air Business Corporation describes itself as specialising in aviation solutions. Refurbishing GSE is one of its main business lines

Air Business Corporation (ABC) is a Paris Roissy Charles de Gaulle International Airport-based company comprising four brands: ABC Ground Support Equipment (ABC GSE); ABC Air Business Consultants; ABC Air Business College; and ABC Charter and VIP flights.

The ABC Air Business College at CDG Airport educates on subjects such as operational management, ground operations, flight dispatch, weight and balance, airside operations generally, passenger services and GSE. It offers more than 100 courses and boasts more than 500 students a year.

And as well as the consultancy and VIP and charter flights aspects of the business,

This Charlatte P2000 electric tractor has been refurbished and converted by ABC into a pushback/baggage cart for business jet operations

ABC is focused on GSE: buying GSE, refurbishing it and supplying spare parts. ABC GSE is based a 25-minute drive from CDG at Beauvais Airport, a third airport serving Paris (alongside CDG and Orly). It has both engineering and paint workshops there, with 1,200m^2 of indoor space and 2,000m^2 of outdoor space.

ABC president Hervé Gueusquin established ABC in 2016 and oversees all its business today. ABC GSE buys used GSE, refurbishes it and sells it on, though most of its work is undertaken as a subcontractor for "important GSE leaders", he says. ABC GSE can train personnel on the equipment and can maintain it, and will travel to customers' work sites on request.

All major brand units and spare parts are offered, including that of TREPEL Airport Equipment, Airmarrel, AVIOGEI, JBT, TLD, DENGE Airport Equipment, Guinault, Timsan and SOVAM. In fact, ABC's GSE is sourced from "Anywhere, but only from reliable sources," says Gueusquin.

Refurbishments are undertaken to order, to four different levels – bronze, gold, diamond or platinum – depending on customer requirements. The different standards offer the following under guarantee:

Bronze
Full revision

Gold
Full revision
External painting
New battery

Diamond
Full revision
External painting
New battery
New seats
New tyres

Platinum
Full revision
External painting
New battery
New seats
New tyres
Engine changed (or cConverted)

The Diamond service is most popular, says Gueusquin, but also popular is the Platinum's warranty of 12 months.

"Our aim is 100% satisfied customers: we are not interested in making quick wins," Gueusquin declares. "We aim for long partnerships based on trust."

Business has been good of late, he observes, ABC GSE receiving requests for equipment even during the worst of the pandemic. "Our GSE partners anticipated the downturn and we have been preparing dozens of units to be ready for sale," Gueusquin confirms.

Electric

ABC GSE has been supplying electric equipment since its creation even before the pandemic. It does not 'upgrade' diesel- to battery-powered GSE, Gueusquin says, insisting, "There is no such thing as an 'upgrade' in going electric: it is a transformation."

Indeed, he doesn't see any economic sense in a ground handler 'converting' a diesel-powered GSE into electric. "Why spend a lot of money on transforming when you can sell your diesel GSE to us and exchange it for an electric unit? I think it would be a waste of time and money."

Moreover, a good diesel engine serves for several decades if well maintained, Gueusquin argues. Batteries for electric-powered GSE might last for seven years and the cost of a lead acid battery is the same as the price as a new engine, with lithium-ion twice as much. Plus, in many parts of the world, users cannot rely on a stable electricity supply, he adds. As a result then, he suggests, while Europe is looking to go 100% electric, most other parts of the world are – at least, as yet – not.

Air Business Corporation is an active member of the Airport Services Association (ASA). ■

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