EXPLORING GSE, AIRFIELD EQUIPMENT AND INFRASTRUCTURE | WWW.AIRSIDEINT.COM

Airside
INTERNATIONAL

WINTER 2023 #AIRSIDEINT

AIRFIELD GROUND LIGHTING

EXPLORING AIRFIELD LIGHTING TECHNOLOGIES AND DIGITALISATION

SNOW CLEARANCE • DE-ICING • ELECTRIC INFRASTRUCTURE CHALLENGES

It's below zero. Howling wind, blinding spray, fingers frozen.

How's your deicing communication?

David Clark Wireless Headset Systems

Contact David Clark for rugged, reliable headset solutions in the most demanding deicing environments. You'll save time, valuable fluids and enhance the overall efficiency and safety of your deicing and anti-icing operations.

Call **800-298-6235** (508-751-5800 Outside the USA) for a **system demonstration** or visit **www.davidclark.com** for more information.

David Clark

WWW.DAVIDCLARK.COM

An Employee Owned American Company

Issue NOTES

William Hallowell

Senior Journalist

william@evaint.com

Welcome to the Winter 2023 edition of *Airside* International in which we cover airfield lighting, de-icing, snow clearance and sustainable GSE, and review inter airport Europe 2023 and International GSE Expo, two of the largest aviation exhibitions.

With sustainability at the forefront of these events, we spoke with several electric GSE manufacturers across the two expos about the new products they are offering, and how they evaluate the future of the markets.

In detail, we interview key players who say there are great infrastructure challenges to overcome before the industry, on a global scale, can fully electrify.

We talk to airports and airfield lighting manufacturers about the shifting technology driving the AGL markets forward. Further, we sat down with one airfield lighting maintenance expert who is calling on regulators to enforce greater compliance with their infrastructure, in order to ramp up safety and maximise the efficiency of airports' operations.

In this latest edition, under our new team of dedicated journalists, *Airside* also explores the importance of maintaining high levels of standards and training to ensure airport operators are safe, competent and compliant on the tarmac.

And as the weather gets chillier – here in the UK, at least – we return to de-icing and snow clearance, in which we learn from airports about how they go about de-icing and anti-icing their aircraft and ensure that airside areas are kept clear of snow and ice so that aircraft can keep flying, respectively.

We hope you enjoy the issue.

Parveen Raja
Publisher
parveen@evaint.com

Ben Chapman
Sales Executive
ben@evaint.com

Alpha Diallo
Digital Creative Director
alpha@evaint.com

Eddie Saunders
Digital News Producer
eddie@evaint.com

Shobhana Patel
Head of Finance
finance@evaint.com

Gemma Keen
Events Coordinator
gemma@evaint.com

Ayo Ogunyoye
Graphic Designer
ayo@evaint.com

Haider King
Delegate Sales
haider@evaint.com

Charlotte Willis
Office Manager
charlotte@evaint.com

Grace Garcia
Events Coordinator
grace@evaint.com

Salam Raja
Video Content Producer
salam@evaint.com

MALMS ENGINEER

Measure

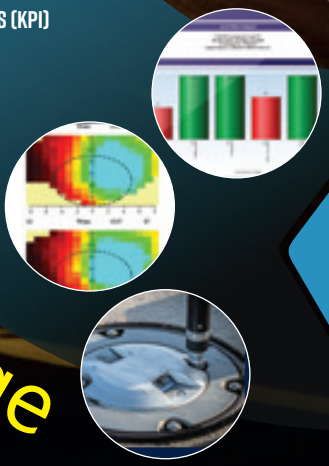
TO COLLECT ACCURATE,
RELIABLE & TIMELY
PERFORMANCE DATA

MALMS
MOBILE
PHOTOBENCH
SIGN & PAPI TESTER
APRON & STAND TESTER
ENGINEER

MALMS
ENGINEER
CMMS

THE LOOP TO BE CLOSED
BY CONTROL PROCEDURES
AND ACTIONS

MALMS
HEAT MAPS | ASSET HISTORY
MEASUREMENT TRENDS | DRILL DOWN
MAINTENANCE REPORTS
IRVR REPORTING
KEY PERFORMANCE INDICATORS (KPI)
ENGINEER



Manage

TMS
Training
Solutions

YOU CANNOT MANAGE WHAT YOU DO NOT MEASURE

AIRSIDE CMMS ASSET MANAGEMENT SYSTEM

- EASY TO USE
- INDEPENDENT
- WELL-SUPPORTED

Maintain

WORK SCHEDULED ON THE BASIS OF MEASUREMENTS & TARGETED
WHEN | WHAT | WHERE
AS REQUIRED

WHEN
WORK IS ONLY DONE WHEN REQUIRED TO KEEP PERFORMANCE WITHIN SPEC

WHAT
WORK THAT IS DONE IS BASED ON THE NEEDS OF THE LOCATION

WHERE
WORK IS ONLY DONE WHEN REQUIRED – FITTINGS WHICH ARE DEEMED SERVICEABLE ARE LEFT ALONE

MALMS
AIRFIELD TORQUE
AIRFIELD LIGHT CLEANER
RAPID SERVICABILITY (RSS)

THE EFFECTIVENESS OF MAINTENANCE WORK

MALMS
DASHBOARD
AIRFIELD LIGHTING SERVICEABILITY
TORQUE STATUS
INSULATION RESISTANCE
TASK COMPLETION
FAULT STATUS
PM STATUS
ENGINEER

Monitor

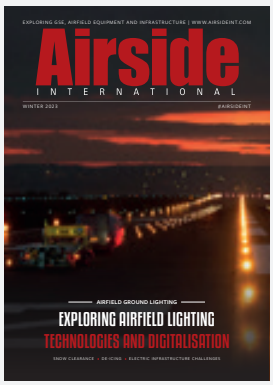
OVER 600 SYSTEMS WORLDWIDE

For more information on our products, services and training solutions, please contact:

Web: www.malms.aero
Email: sales@malms.aero
USA: 828-289-0612 (Toll Free)
UK / International: +44 1926 479072

Contents

WINTER 2023



Issue 64
www.airsideint.com

Join the conversation
Twitter: @airsideint
Linkedin: /airside-international

Advertising contact
Ben Chapman, Sales Executive
T: + 44 (0) 20 8253 4011
E: ben@evaint.com

Address changes and subscriptions:
charlotte@evaint.com

ISSN 1755-8697

EVA INTERNATIONAL MEDIA LTD
PUBLISHERS & EVENTS SPECIALISTS

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

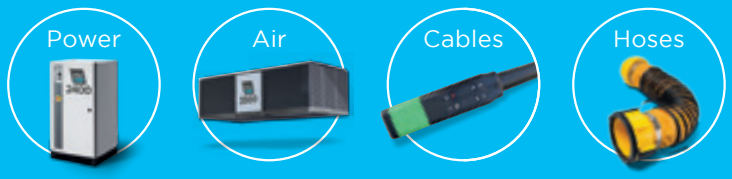
Tel: +44 (0) 20 8253 4000
Fax: +44 (0) 20 8603 7369

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
Hounslow, TW4 6NF

ITW GSE



Simply smarter ground support

There's more to your gate than meets the eye...

Introducing EcoGate

– your high-efficiency ground support system

More efficiency, more intuition, more savings, more progress. But only if you look deeper than individual GSE units and start capitalizing on the connections between them.

Unleash the hidden value in your gate equipment

Is newer technology shifting the AGL sector forward?

William Hallowell explores some of the airfield ground lighting (AGL) infrastructure projects currently underway in the US, whilst lighting manufacturers share their thoughts on the continental markets today

Perhaps just in time for this issue of *Airside*, in which we look at the airfield lighting sector, the US government announced in late September that more than US$ 201 million in funding would be given to almost 100 airports across the country to improve their lighting infrastructure.

Part of the government's Bipartisan Infrastructure Law, the funding is "acting to improve lighting systems at 82 airports, [which is] an important part of keeping aircraft moving safely, no matter the time of day or weather", according to Pete Buttigieg, the US Transportation Secretary.

One of the airports benefiting from this funding is San Francisco International Airport (SFO) in California, which plans to upgrade its "critical electrical backbone infrastructure" on the runway, explains Lalesh Sharma, electrical engineer for the airport's design and construction group.

He says SFO plans to use this funding to replace the existing medium voltage (5kV) airfield cables that provide power to the runway edge, centre, touch down zone and guard lights circuits for Runway 10L-28R, as the cables "have exceeded their service life and are no longer cost effective to perform preventive maintenance".

LEDs are the 'long-term' goal

On the type of upgrades SFO will install, Sharma explains that the airport's goal is to have all LED (light-emitting diode) lights in order to improve its operations.

"The airport's long-term goal is to convert all airfield lighting and signage to LED, which will reduce electrical grid demand, increase service life [for its assets] and improve efficiency."

He adds that "the conversion will benefit the electrical backbone" by also minimising "electrical demand stress" on the existing cables, and that it will help the airport achieve its sustainability and resiliency goals.

Smart solutions?

On whether San Francisco would look at smart solutions to its lighting infrastructure, Sharma says that during the programming phase of any project, the airport typically evaluates any available FAA (Federal Aviation Administration) approved technology.

Airports are restricted from using non-approved technologies on the airfield in order to ensure they will meet the minimum safety standards set by the FAA.

But: "Improving lighting infrastructure is an investment that pays a variety of dividends to an airport, including reduced downtime and maintenance, longer lifespan, improved visibility, and ultimately, safer and more efficient operations.

"Often electrical airfield infrastructure is typically overlooked ... until it has failed or starts to impact the operation, [but] SFO has a dedicated team of professionals that believe in a proactive approach to airfield electrical infrastructure."

Maintenance and weather considerations

With guidance from the FAA, SFO employs a preventative maintenance (PM) programme comprised of regularly scheduled inspections to prioritise repair and replacement work, aiming to minimise operational disruption.

Sharma explains that the airport's PM programme is performed by its high-voltage electricians, who carry out daily, weekly, monthly, semi-annual and annual inspections.

"The team collaborates with multiple SFO stakeholders to identify anomalies and prioritise repairs and PM work. Overall, the PM addresses all the critical items noted in the FAA Advisory Circulars for maintenance of airport visual aids, including testing, monitoring and inspection.

"The weather plays a very important role in determining when preventative maintenance would occur, except for emergencies.

"Priority is always given to FAA air traffic control to ensure preventative maintenance has minimum impact on airfield operations," he continues, adding: "Preventative maintenance is typically scheduled during visual flight rules and during the day, and is not permitted during instrument flight rules."

Ahead of the curve?

Los Angeles International Airport (LAX), also in California, is currently undertaking airfield lighting modernisations too, although its projects are independent of the Bipartisan Infrastructure Law funding earmarked for airfield lighting systems.

***Lalesh Sharma**, electrical engineer at San Francisco International Airport*

LAX is reconstructing approximately 3,000ft of the eastern end of Runway 6L-24R and upgrading all the lighting fixtures to new LEDs as part of its North Airfield Exit Taxiway project that began earlier this year.

Already equipped with runway status lights (the in-pavement lights that alert pilots that entering a runway is unsafe due to other traffic on or approaching the runway), the airport is installing LEDs across its four new exit taxiways from the north runway complex.

Mark Vicelja, chief airports engineer at Los Angeles World Airports (LAWA), says: "Over the years we've replaced most of our older lighting systems with LEDs, and as we go through each one of our new projects, we're ensuring LEDs are used.

"At LAX, we've been very proactive with our lighting systems, installing some state-of-the-art technologies as soon as the FAA endorsed them."

He explains that LAX is ahead of the curve with regard to its lighting infrastructure, given that it already has much of the FAA-approved equipment that airports will be installing with the funding announced in September. This includes runway status lights.

"Lighting systems are critical to airfield safety, especially pilot situational awareness at night. As safety is the number one priority airside, LAX has maximised its airfield lighting systems with both elevated and in-pavement guard lights at all our runway intersections, and centreline and edge lights on all our taxiways and runways.

"LAX spends a lot of effort making sure our lights are all functioning, on maintenance and inspections during operations."

The airport was a beta test site for the FAA Runway Status Light programme and was fully outfitted with runway status lights on its two main departure runways and all crossing taxiways in 2014.

Vicelja adds that as part of its lighting infrastructure project, LAX will be installing additional runway status lights across the intersections and tying these into the existing system.

Technology and the market

Midstream Lighting, based in the UK, has worked on more than 100 projects in 60 countries, and whilst predominantly offering solutions for apron lighting, also delivers AGL projects.

According to Yuli Grig, commercial director and co-founder, the AGL market is becoming more "consolidated".

He explains that he has witnessed growth in the market in recent years as a result of three factors: construction of new airports, development of existing airfields, and expansion through projects such as additional runways.

But Grig highlights that a series of mergers over the last few years has resulted in less choice for AGL customers. "There are fewer and fewer choices for customers, but I think this is as a result of the space being highly technical and highly regulated," he says.

"From a sales standpoint, the AGL market is expanding. We're seeing some additional runways being built around existing airfields for expansion work, but we're also seeing quite a lot of

LAX installs "state-of-the-art" technologies as soon as the FAA endorses them, says the airport's chief engineer

TREPEL
AIRPORT EQUIPMENT

THE NEW

TLTV CHARGER 380

fast . strong . comfortable .

CHARGER 380 - the latest innovation in towbarless aircraft tractor technology. This aircraft tractor is ideally suited for pushbacks, intergate towing and high-speed maintenance tows.

***Regardt Willer** (left) unveils ADB SAFEGATE's AXON EQ light at inter airport Europe 2023*

reconstruction with upgrade programmes, which includes AGL.

"LED has become the dominant platform for airfield lighting now. Nobody is really manufacturing or utilising halogen lights, which were the main way of lighting airfields six or seven years ago.

"There's been a huge technological shift to LEDs, which leaves its own set of challenges because some airports are now faced with a choice of converting to LED or not having spare parts for their old systems."

Grig says that as an "LED native" company, this gives Midstream a competitive advantage with regard to the market because "we were born based on this technology".

On the continental markets, the commercial director expresses that he would like to see Midstream involved in more projects in North America.

But, because it does not manufacture in the US, Midstream is restricted by regulations that prevent companies that do not produce their products there from doing so – which raises an interesting point about market expansion for manufacturers based in Europe.

In spite of this, however, Grig says he sees much potential for widening Midstream's geographical scope with the expansion of the markets in Asia and the Middle East, where new airports are being constructed. He predicts Asia will be an area of great interest as a result.

Grig adds: "Africa is interesting because they appreciate high-quality, European products and therefore that has a big potential. We work in about 12 or 15 countries in Africa at the moment.

"And with regard to South America, there's a language barrier there for European companies unless you speak Spanish, but if you can overcome that with a local partner, that market is also very interesting because they're investing quite a lot in aviation at the moment."

Does halogen have a future?

In spite of the commercial director's emphasis on LED lighting, and the fact that many airports in the US are striving to have all their AGL infrastructure swapped out for LEDs, some lighting manufacturers believe there is still a market for halogen lights.

German manufacturer NARVA (Vosla GmbH) plans to keep producing halogen bulbs for the next 10 years, despite market predictions that the technology will be overtaken by LED ground lights.

Marcel Voss, key account manager of AGL at NARVA (Vosla GmbH), believes halogen bulbs are "old and reliable technology", and that LEDs are "not the future" necessarily for all areas.

"We still have halogen bulbs for airfield ground lighting and we believe this is important because there are some market rumours that they will be eradicated from the market" as a result of inferiority to new lighting technology, he says.

"But this is not so. We will continue to produce these lamps for the next 10 years because they are the base of our business, and we use halogen technology for the other industries we provide lights for.

"At the moment we are also developing our first retrofit lights for AGL. So, we can take old bulbs out and fit new LEDs in as airports want it."

With 40% of NARVA's clients based in Europe, the company is focused on the northern European market, for example in Scandinavia, because, Voss explains, halogen bulbs produce enough heat to melt snow without additional devices and they are more robust, which is important for those colder countries.

However, he admits that the manufacturer's market share is decreasing due to the influence of LED technology.

Virtualising AGL infrastructure

ADB SAFEGATE (which provides integrated solutions including airfield lighting, power and control systems, airport and tower software, docking automation, apron management and aftermarket services to airports, airlines and ANSPs) says it is "virtualising" the airfield lighting sector with its new Airside 4.0 smart solution.

The idea, explains Regardt Willer, vice president of business development and innovation, is to "take physical assets and add sensors to them in order to collect additional information and push it to the cloud".

ADB SAFEGATE says its new solution allows airports to react to the analytics recorded on their assets to ensure a seamless operation through improved efficiency.

"We hear a lot of people talking about digital twins, and we're creating that in the asset world for docking systems and airfield lighting," says Willer.

"With ALIS, our digital asset tracking and service inspection system, we can virtualise

an entire airfield. [With Airside 4.0] we can show you all your assets and real-time information about how they're performing.

"If you have a failure of an asset, you can click on it and get more details about what's going on there ... which takes that intelligence to another level."

The VP explains that with this new technology, airports can see if operations are running on time across the apron through data indicating whether passengers' baggage is being loaded and unloaded on time, or if the catering truck is late, for example.

With the ability to make judgements based on real-time data, airports can act to improve turnaround times for their aircraft and ensure their operations can run more smoothly.

Willer adds: "We can make predictions based on past events. We can model these and do what's called predictive off-block time – predicting when we'll actually be able to turn that plane around.

"So now airports can be more proactive in taking decisions that planes are landing and need to be moved to another gate and so need to be given a heads-up.

"We're able to pre-emptively know what's going in an asset before it reaches critical stage."

As a part of the Airside 4.0 concept, ADB SAFEGATE launched its AXON EQ LED elevated light in October at inter airport Europe 2023, describing it as a key building block for digitalisation of airfield operations.

Like the AXON EQ inset lights previously launched, the elevated light comes equipped with integrated sensors and communication technology, providing situational awareness and fixture status.

At the product's unveiling, Paul Hart, project manager for lights and power at ADB SAFEGATE, said: "This product is unique in the sense that it's a new high-intensity fixture that covers all high-intensity applications, including approach, threshold, runway and stop bar. A single, modular platform – that's the approach.

"It has many unique features – we've incorporated circling guidance, sensors that allow detection for towing and alignment problems, infrared capability, and on top of that the ability to configure how those work for each airport's operation.

"We really envisaged this as a future-proofed product that we're going to see as the next generation of elevated LED technology that can work and change with an airport as we go."

Hart added that the AXON EQ will be "best in class" in terms of power consumption.

Whether they opt for LEDs now or later, or not at all, airports clearly have other choices to make too in terms of their investment in AGL as the industry continues on its journey to a 'smart' future.

But it is certainly interesting that some manufacturers still see market potential in halogen lights, despite airports' focus on investing in LED technology, and the option to digitalise their infrastructure. ■

Expert calls for greater compliance with airfield lighting regulations

In conversation with *Airside*, one industry expert emphasises the importance of ensuring AGL maintenance is compliant with regulations

***Robert Shapton**, managing director of Tailor Made Systems*

According to Robert Shapton, managing director of Tailor Made Systems (TMS), airports must go further to ensure their airfield lighting is compliant with regulations – and that they are taking this responsibility seriously.

TMS provides AGL photometric testing equipment and services, widely recognised globally as MALMS, which also includes an associated AGL maintenance suite of tools.

Developed from a UK Civil Aviation Authority research programme, the MALMS equipment caters for all photometric, mechanical and electrical aspects of airfield lighting maintenance, and enables airports to justify and demonstrate compliance with regulations.

However, a "culture" of not taking on this responsibility, Shapton says, is having a damning impact on the safety of airports' operations globally.

He suggests complacency is common due to airports assessing the condition of their airfield lights by visual inspection, as opposed to utilising the benefits of smart technology.

This complacency, Shapton explains, places a limitation on asset efficiency.

> ***"If you think maintenance is expensive, try an accident"***
>
> ***Robert Shapton,*** *managing director of Tailor Made Systems*

Compliance with airfield lighting is vital, the managing director says, because "when you take off and land at an airport you expect the visual aids – the lights – to be compliant so that pilots can be given the visual cues needed to operate safely".

He adds: "If you look at aviation fatal accident statistics, 63% of these accidents occur on final approach and landing. Of these, more than 90% occur in lower visibility conditions."

These figures demonstrate just how crucial airfield lighting maintenance is for safety, Shapton stresses.

"An airport has to be able to demonstrate that it is operating safely", and there are regulatory requirements airports must adhere to.

They must document their maintenance processes and procedures, be able to demonstrate these and show they are achieving the operational performance mandated in the regulations, Shapton explains.

Additionally: "The standards themselves as defined by ICAO [the International Civil Aviation Organisation], regional and national authorities need to be kept up to date, and certainly it is observed that the standards are lagging behind the advancements in technology and the developments in the industry."

On standards, Shapton argues that regulatory authorities must go further than simply publishing the rulebook and must actively encourage airports to improve their maintenance procedures.

"It appears that some regulators do little or anything at all to positively enforce compliance," he says. "That's not their job, but they do need to support safe and compliant operations.

"It's not enough to publish the rules and attend airports in the event of an accident.

They need to promote a culture that airports need to follow compliance rules more strictly."

He says the biggest single cause of poor airfield lighting performance is airports not cleaning their lights regularly because in some parts of the world, airports consider cleaning to be outside their remit, and that it is instead the responsibility of airport inspectors – though Shapton disagrees.

"There is a common attitude that 'the lights are on so they must be working'. It is observed that many airports have no idea that their lights might be non-compliant, and principally this is because they don't have a system that enables them to measure the lights' output."

A light has a particular beam intensity, colour and orientation, and this cannot be assessed with a visual inspection alone, Shapton stresses.

He explains: "As we move into the Airport 4.0 era with artificial intelligence technologies and the digitalisation of airports, maintenance planning and records similarly need to be digitalised, which would enable decisions to be made in 'real-time'.

"Solutions do exist, from large enterprise management systems through to the more manageable asset management solutions in the form of the MALMS Computerised Maintenance Management System (CMMS). Our system utilises smart technology – helping airports to stay both compliant and efficient.

"As we move away from paper-based records, which were standard 20 to 30 years ago, modern communication technology such as the Internet of Things helps to maintain airside assets more efficiently and improve safety and compliance.

"Using the MALMS CMMS, universally known as MALMS Engineer, to maintain your records enables you to access AGL performance data in real-time, or collate over a period of time, using its analytical and reporting tools to identify trends and improve your asset management to achieve better results and operate more efficiently.

"This allows airports to 'join up all the dots' and help them predict when they will need to replace some of the assets, or when they're moving from a compliant to a non-compliant status, and to assist them in evaluating how often they need to clean their lights," Shapton outlines.

The MALMS CMMS solution works by accurately measuring, maintaining, monitoring and managing asset data.

Shapton explains that this means collecting accurate, reliable and timely performance data, scheduling work on the basis of the measurements, providing effective maintenance and enabling airfield maintenance teams using the data collected by the CMMS to move from "reactive to proactive" maintenance procedures.

Further, he emphasises that CMMS data can also be used to verify regulatory compliance.

"If you think maintenance is expensive, try an accident," the managing director says. By making the jump to smart technology, Shapton believes airports can maximise compliance and ensure safety. ■

Pictured: ITW GSE's 7400 eGPU

Lack of infrastructure proving biggest hurdle to electrification

Industry leaders in electric GSE explain to ***William Hallowell*** how poor infrastructure is preventing the sector from transitioning to more sustainable solutions

Sustainability and electrification are two of the hottest topics in the aviation industry today, and momentum only seems to be growing for both the global and continental electric GSE markets.

As airports and ground handlers look increasingly to adopt more environmentally friendly GSE, manufacturers are creating new, innovative products to tailor the needs of their customers.

But the electric alternative is not just beneficial to the environment. "There aren't really any excuses" not to go electric, as one manufacturer explains, because of factors such as low maintenance requirements, as well as reduced fuel costs, noise pollution and the actual cost of equipment such as electric vehicles (EVs).

Whilst attitudes towards the use of electric GSE remain positive, though, the sector is facing significant barriers to greater uptake as a result of lack of infrastructure.

Airports and ground handlers are holding back on investing in equipment such as battery-powered ground power units (GPUs), tugs or tractors due to a shortage of charging stations, for instance.

Indeed, there seems to be a general consensus around the idea that a lack of infrastructure to accommodate sustainable GSE is preventing the acceleration of the global industry's transition from fossil-fuelled equipment to electric or hybrid models.

Is bureaucracy the biggest barrier?

According to Neil Bennett, managing director and CEO of Flying Pig GSE, an equipment solutions provider based in Seattle, "bureaucracy" is preventing a wider uptake of electric equipment, globally speaking.

"People aren't getting into electric GSE

***Neil Bennett**, managing director and CEO of Flying Pig GSE*

because of the infrastructure [issues], not because of the costs," he says, speaking on the industry's concerns that going green could cost more in the long-term.

"It generally takes an airport between three and five years from idea to installation, going through the process of installing electric chargers [due to] bureaucracy.

"But there are portable battery banks you can now buy if you want to jump into GSE electrification tomorrow morning.

"To go electric immediately, you can buy or lease a mobile trailer – a battery, essentially, on wheels that will get you your charging infrastructure while the airport is going through its three-to-five-year plan."

So, there are ways to circumvent the challenges presented by poor infrastructure, as opposed to simply calling on airports to improve it.

Bennett adds that the difficulties surrounding different charging procedures have led to confusion about how best to electrify.

"Globally, there are three different charging protocols. The communication between the battery and the charger [for example] in Asia, Europe and North America are different languages," he says.

But whilst this may prove to be a barrier for airports and ground handlers who want to go green, other GSE manufacturers are offering solutions.

Standardisation would 'help everyone'

Luke Mulvaney, co-founder of Waev, a California-based EV manufacturer, argues for the need for cross-industry standardisation as a way to improve global uptake of electric GSE, given the difficulty presented by the fact that different continents have varying charging procedures.

Where airports and ground handlers want to opt for more sustainable alternatives, he wants Waev to form part of the sector-wide solution.

Discussing how poor infrastructure is discouraging the transition from diesel to battery-powered equipment, he says: "It's got to be a coalition across the industry, and there are things going on like

***Luke Mulvaney**, co-founder of Waev*

standardisation of charging that people are talking about. That would help everyone.

"We've made electric vehicles [since] before it was cool and we're still going to be on the leading edge of that as much as we possibly can," Mulvaney continues.

"So, we are very interested in being an unbiased partner and making sure this works for everyone.

"If a customer wants to go electric and they're struggling with the airport or the airport wants to go electric and they're struggling with the ground handlers, we're going to get involved and figure it out."

Mulvaney describes how Waev has worked with companies to ensure they have the right infrastructure to facilitate the roll-out of electric GSE.

"I'll give you one scenario where there's a large airport in our backyard that wanted to implement electric," he explains.

"They went ahead and bought some chargers before knowing what chargers would be best to support different equipment, and so now they have this infrastructure there that they're trying to figure out how to let their ground handlers and operators use.

"We partnered with the airport and the ground handlers to modify our product so it could charge with that system."

Stakeholders need to take charge

David Feuga, global sales director for international GPU supplier ITW GSE, argues that stakeholders need to be encouraged to invest in infrastructure as a long-term solution to accelerating the transition to a more sustainable industry.

"The problem that the industry is facing is that electrification goes with infrastructure investments," he explains.

"It's not a quick fix, because if we all go electric tomorrow the airports will be lacking in infrastructure to charge all of their electrical equipment.

"The bottleneck today is not necessarily the implementation of electrification, it's more to say, 'how can I charge the equipment?'.

"We are talking about how to better utilise the power available to share the resource with the stakeholders to help them to electrify. Airports are not reluctant, they are just facing an infrastructure challenge."

Feuga adds that this is why ITW GSE started looking into technologies for power sharing and management, to help airports, handlers and airlines transition faster and smoother to all-electric gates.

Using these technologies, ITW GSE says it can add charging outlets and stations to the already installed infrastructure, without costly upgrades to substations or having to do extensive ground works.

"If we're all fragmented and do our stuff in our silos, it's not going to happen that quick."

Feuga shares Bennett's view that bureaucracy is standing in the way of progress. He adds that government-owned airports are to some extent holding back progress, whereas the private sector is "faster at doing things" because it is less restricted by bureaucracy.

It is clear, therefore, in conversation with industry professionals, that there is certainly an element of consensus over the obstacles the industry is facing – but also in how to overcome them.

From standardising infrastructure to reducing bureaucracy, professionals across the sector are emphasising the importance of collaboration on a global scale in order to see a wider uptake of sustainable GSE.

New, green airports are the way forward

Fundamentally, however, "the airports aren't ready," according to Aleksandr Skrebnev, vice president of sales and marketing at ElectroAir, a GPU manufacturer based in Estonia.

He is optimistic about the construction of new, green airports and their role in advancing the sustainability cause across the sector, as opposed to drawing attention to existing airports' need to fix their infrastructure issues.

Airlines and ground handlers want

Waev's Tiger Li-Ion electric tractor on the tarmac

electric solutions, but airports owned by a country, a government or another stakeholder, may not be prepared to address the infrastructure shortfall.

However: "Right now in Africa, Asia and the Middle East, around US$150 billion combined [is being spent on] airports under construction," Skrebnev says.

"One notable airport [to mention] is the Red Sea International Airport in Saudi Arabia ... which is going to be a completely sustainable airport.

"These developments are happening across the industry, which gives significance to electrification because the demand will be there [and] the end user will be expecting a more sustainable solution in terms of how environmentally friendly [our products] are.

"I believe the new airports that are going to be constructed in this era should consider the future. If electrification is going to happen, it will never happen without the proper infrastructure," Skrebnev stresses.

It is certainly striking how industry professionals working around the world have highlighted many of the same issues, yet draw different conclusions as to how to ensure progress.

As Mulvaney argues, it is important to offer solutions for today's infrastructure. And perhaps one of the most important next steps is to introduce global standardisation for factors such as charging facilities, which in theory could encourage more airports to opt for electric equipment, invest in the necessary infrastructure and reduce the bureaucracy Bennett describes, because stakeholders would be able to rely on the same charging facilities being universally rolled out on an international scale.

However, a truly global standardisation of infrastructure would be incredibly difficult to roll-out – particularly at any great speed – given different geopolitical and socioeconomic factors.

As Skrebnev points out, the move towards sustainable GSE on the scale envisaged by industry leaders is likely impossible without the simultaneous, worldwide progression of the required infrastructure needed to facilitate the transition.

What is interesting about discussions on going green is the gap between what industry leaders are saying, and what they are actually doing.

Whilst this is not to discredit the work of electric GSE manufacturers, one CEO put it to *Airside* that whilst many companies are outwardly promoting the sustainability cause, they are doing little materially to support it simply because of the sheer cost of looking at more environmentally friendly solutions.

Performative companies, they say, are looking to enhance their reputations – which certainly sheds some light on how major players really see the global community's commitment to a greener industry.

The development of electric vehicles across the aviation industry, therefore, will certainly be interesting to watch as it draws ever closer to its 2050 sustainability targets. ■

Electric, adaptable tractor simplifies ground operations

CEO ***Dean Kneider*** expands on Hallor Group's unique electric vehicle solution, which seeks to answer the evolving needs of the GSE market

Hallor Group is a Canada-based electric vehicle (EV) manufacturer that says it offers a pioneering solution for ground handlers and airports looking for a green alternative for their airside operations.

With its Green Ox modular electric tractor that can perform multiple functions, Hallor believes it offers a "best-in-class" solution with "unmatched features".

CEO Dean Kneider says the company is looking to be a trailblazer in the GSE market as interest in EVs is on the up.

"We are pretty passionate about the EV industry," he says, adding: "We've recognised where we want to be in five years, and we're looking at the industry and thinking about what is changing."

As a zero emissions vehicle retailing at US$55,000 for the base tractor, he explains that the Green Ox is beneficial both economically and environmentally as a "purpose-built" EV designed to adapt to customers' requirements.

Further, the tractor's ability to utilise telematics enables end users to track performance data and make ongoing cost-saving decisions based on usage patterns.

Kneider says the Green Ox's modular build enables it to be ordered as a cabbed version, XL 4' to 8' back deck, belt loader, GPU or pushback, with additional attachments of 'drag alongs' – portable stairs, a lavatory or water cart and de-icer.

"This means a unique product for airports and ground handlers who are considering electric alternatives," he expands.

In production, the back third of the vehicle can be adapted to accommodate any one of the appliances, whilst the front (steering, motor and controller) and middle (the battery and ballast) thirds are kept the same.

The idea behind this, Kneider explains, is that operators will not need to have additional training to use the vehicle for each of the different configurations – whether it has been adapted as a belt loader, pushback, or de-icer, for example.

"We have the belt loader as a full unit, which is an 'order as is'. But in factory assembly the back third of the vehicle is different to support the belt loader as a drivable and standalone unit, or the stairs, which is often a 'drag-along' unit, like the toilet cart."

The CEO adds: "When we designed the modular build we wanted people to own multiple products, not just one, in the different

Pictured: Hallor Group's Green Ox electric tractor

forms they come in so that the tools and training are the same, which will reduce costs.

"Because if you've got a belt loader from one vendor and a baggage tractor or de-icer from another vendor, then you've got multiple sets of tools, multiple different parts and multiple training for each.

"What we're trying to do is provide a solution for those who want an efficient and cost-effective GSE fleet.

"But we are trying to do it in stepping stones for airports, airlines and procurement officers year by year. So year one, you buy, say, five tractors; year two, you start focusing on your charging infrastructure; and year three, you start replacing your belt loader and expanding your fleet. Now, you have all the same tools and all the same training."

Hallor Group is currently focused on the North American market, being based in Canada, but has plans to expand by having manufacturers based in Europe and Australasia. ■

***Dean Kneider** poses with the Green Ox at this year's International GSE Expo in Las Vegas*

Keeping aircraft safe to fly in icy conditions

In two of the features of this issue of Airside, we look at how airports maintain their operational intensity even in harsh winter conditions. Here, ***Mike Bryant*** talks to a number of airport operators in Europe and on the North American continent about how they de-ice and anti-ice their aircraft visitors; some gateways continue to de-ice at gates, while others have opted for specialised, remote de-icing pads

The winters can get very cold and very snowy in Canada. In an average winter season (not including recent Covid-affected years with lower traffic volumes), no less than 16,500 aircraft might be de-iced at Toronto Pearson International Airport, informs the airport's director of de-icing operations, Ken Eastman.

De-icing at Toronto typically takes place anytime between the end of September and the last days of April, though recent years have seen de-icing operations continue into May more frequently than had previously generally been the norm, Eastman advises.

He notes that aircraft de-icing can actually take place in temperatures as high as double-digit degrees in certain conditions..

While the Canadian gateway is home to a number of fixed base operators (FBOs) that anti-ice smaller aircraft, all Pearson's commercial narrowbody and widebody aircraft are de-iced at its state-of-the-art Centralized Deicing Facility (CDF). This was originally constructed in 1998.

All air carriers have transferred their aircraft de-icing operations to the CDF – a move that has subsequently proven to be a wise one, Eastman says, given that

common use of the CDF offers speedier turnaround times than gate de-icing as well as environmental benefits, of which more later.

The CDF, which covers a 65-acre site, is located in the centre of Toronto Pearson's five runways, thus offering easy and quick movement from the facility to take-off for departing aircraft.

Described by Greater Toronto Airports Authority (GTAA), Pearson's operator, as the "largest and most technologically advanced de-icing facility in the world", it has the capability to de-ice more than 500 aircraft a day.

The CDF has six separate de-icing pads. Each pad has a staging bay and a de-icing bay, as well as three approach lines.

Six widebodies can be de-iced simultaneously when they use each bay's centre line, or up to 12 narrowbodies of up to A321 size when they use the north and south approach lines of each pad.

De-icing movement coordinators (DMCs) oversee the de-icing process from a control centre, or 'Ice House'. Pilots are told which bay to use and electronic signboards at the CDF also guide flight crews to their correct pad and parking position on the de-icing pad. Their location is always electronically represented in the Ice House.

The fleet of de-icing vehicles used at the CDF is made up of "some of the most advanced in the world", GTAA believes – specifically, 46 Vestergaard Elephant BETA units. Each is manned by a single operator.

While ensuring safety and performance, operators strive to use as little fluid as possible. All operators receive training before each winter season as well as during the season as required.

De-icing fluid is heated within the vehicle and once de-icing is completed and the vehicles move away, the pilot is advised via radio communications and by electronic signage that the aircraft can leave the CDF.

As well as the Elephant BETAs, three vehicles specialised for under-wing and landing gear de-icing are also available for use at the CDF.

Each pad is sloped 2 degrees from north to south. Spent glycol as well as run-off water is thereby collected in catch basins.

Toronto has four giant underground collection tanks for the storage of spent glycol, so that it can be treated or disposed of.

Fluid that has less than 3% glycol concentration can be treated within the available sanitation systems; any fluid with a higher glycol concentration is sent to a processing facility, where its concentration is processed back to about 50% ready for sale into the glycol after-market.

Eastman confirms that GTAA continues to investigate the possibility of implementing a 'Triple R' process of Recovery, Recycling and Respraying of its glycol run-off, as has been introduced at some other airports.

The de-icing team at Pearson takes in close to 200 people, including 132 de-icing

specialists in the Vestergaard vehicle fleet, 25 DMCs, and supervisors and managers.

Many of these people move to other work in the non-winter months, though others are employed at the airport on seasonal contracts.

Memphis also opts for a CDF

While rare, centralised de-icing resources are by no means confined to Toronto Pearson's state-of-the-art facility, nor to Canada. Also on the North American continent, where land is not perhaps at quite such a premium as in Europe, Memphis International Airport in Tennessee also has a new Centralized Deicing Facility (CDF).

Its CDF was only opened recently, on 21 November 2022, and in this last (2022-23) winter season it served approximately 350 aircraft.

Memphis used to de-ice on the passenger terminal or cargo aprons, but now uses the US$309 million CDF to offer a much more efficient de-icing process, says Terry Blue, the airport's chief operating officer and executive vice president of operations.

Located at the southern end of the airfield between parallel runways 36L and 36C and covering an area of approximately 295,000m2 with 73 acres of new concrete paving, the CDF is large enough to de-ice up to 12 B747s simultaneously. Eleven of the bays can take aircraft of up to B777F size; the twelfth can handle an A380.

Memphis' CDF features blending bays and load stands at each pad where de-icing trucks can fill up their tanks with glycol, thus avoiding any need for them to drive to another site for fluid re-supply.

This capability was not available last year but will be for the coming winter season, which in Memphis is regarded as extending between 1 November and the end of March (during which there might be roughly 30 to 45 separate periods of harsh winter conditions requiring de-icing).

Moreover, because the pads – as at Toronto – are all slightly sloped, glycol run-off from the de-icing process at the CDF can be collected in drainage ditches and diverted to an underground storage area. The fluid is then piped to a waste treatment plant where it can be treated or otherwise disposed of appropriately in what Blue

De-icing at Munich

Established three decades ago, EFM specialises in aircraft de-icing as well as aircraft moving (pushback and towing) and air conditioning services at Germany's Munich Airport. It is the only company to provide de-icing services at Munich Airport.

The de-icing season officially starts on 1 October and ends on 30 April, explains Bettina Siegemund, who is responsible for corporate communication with EFM.

However, as the de-icing business depends on the weather, there is no 'typical' winter season in Munich, she suggests.

EFM de-iced approximately 5,300 aircraft in the 2019-20 winter season, approximately 2,400 in 2020-21 (during Covid), approximately 6,300 in 2021-22 and approximately 6,000 in 2022-23. There were winter seasons prior to 2019-20 in which EFM actually carried out up to 15,000 de-icing operations.

Most aircraft are de-iced just before take-off with their engines running at special de-icing pads (so-called remote areas) at the heads of Munich Airport's runways.

There are three de-icing pads for each take-off direction on the gateway's north and south runways. Each de-icing pad is served by several de-icing vehicles.

Currently, EFM permanently employs about 150 towing tractor drivers/de-icers on shift work. During the winter season, its operatives work as tractor drivers or de-icers – depending on their shift.

These staff use Elephant BETA de-icers and EFM took delivery of two new hybrid Elephant e-BETA de-icers in September, confirms Siegemund. The de-icing fleet at Cologne Bonn now numbers 24 vehicles. ■

CELEBRATING 25 YEARS GLOBAL GROUND SUPPORT

Tough Times Call for Teamwork

Your Ground Support Equipment Provider

Ready ❄ **Reliable** ❄ **Responsive**

GLOBAL GROUND SUPPORT An AirT Company

www.globalgroundsupport.com

Tel: +1-913-780-0300

De-icing training under way at Memphis Airport

describes as a "win-win situation for the airport and the City [of Memphis]".

Operations through the facility are overseen from the CDF Control Tower, and the Icelink web-based software offered by Cambridge, Ontario, Canada-based JCAI, Inc (JCAII) is available for those operators that want to use it.

Icelink is a web-based de-icing management system, whose Icelink Deicer and Truck modules enable de-icer ground service providers to link their ramp assets throughout the de-icing process in such a way as to optimise their performance.

The system offers real-time status updates and electronic synchronisation of the trucks' work, accessed via web-connected devices like iPads or smartphones.

As the home hub of express services giant FedEx's freighter fleet, Memphis is the world's second-busiest air cargo gateway and operates on a 24-hours-a-day, 365-days-a-year basis.

It handles some 220,000 aircraft operations a year. Most de-icing takes place in the colder hours of the night, when the freighters of FedEx and other integrator carrier visitors (UPS and DHL) operate their regular flight services.

A simple de-icing of a narrowbody aircraft in the CDF might take five to seven minutes, whilst a simple de-icing of a widebody might take more like eight to 10 minutes. But more complex de-icing and anti-icing procedures would take longer.

The CDF's services are offered by Memphis Airport owner and operator Memphis-Shelby County Airport Authority (MSCAA), but airlines that use the facility arrange for their own de-icing handling provision.

They either do that through their own ground services division or contract a third party to provide de-icing services. Today, Memphis welcomes the three cargo carriers listed above as well as about 10 passenger airlines, most of which use the CDF.

Those that want or need to can base personnel in the CDF Control Tower, from where taxiing instructions for the CDF are issued to flight decks. The tower is also where CDF bays are allocated and where the control of the movement of both aircraft and vehicles at the CDF takes place.

Memphis has had a large amount of positive feedback on the CDF, Blue confirms, explaining that the airport has received "high praise from operators who have said that de-icing processes are now safer and that efficiency has been improved by an order of magnitude".

MSCAA has also been delighted to show visitors around the CDF who are keen to assess the potential benefits of a centralised de-icing pad at other airports.

Gate work

Of course, many airports continue to de-ice at gates. Across the Atlantic, all de-icing is handled at the gate at Germany's

Cologne Bonn Airport's fleet of de-icing vehicles

Cologne Bonn Airport, for example. There is no infrastructure for remote, pad-based aircraft de-icing at Cologne Bonn but Oguz Ipek, senior manager of de-icing in the Ground Services Division of Flughafen Köln Bonn, the gateway's operator, tells Airside that the de-icing team there might de-ice as many as 1,400 or so aircraft in an average winter season.

For the Ground Services Division, the Cologne winter season usually extends between 1 October and the end of April, but the approximately 70-strong team were still de-icing as late as the middle of May one season just a few years ago.

Last winter, they de-iced just less than 1,400 aircraft over the season. Most of the aircraft served are narrowbodies, many of them operated by the low-cost carriers flying through the gateway, but some are passenger widebodies and some are widebody freighters operated by the express services giants FedEx and UPS.

Today, Cologne Bonn's Ground Services Division is responsible for de-icing all aircraft passing through the airport with the exception of UPS's freighters – UPS usually self-handles its de-icing, although on occasion, when it has been busy and the weather has been very bad, the airport operator has stepped in to support and supplement UPS's own de-icing efforts.

Up until just prior to last winter, Lufthansa Technik had been de-icing the aircraft of the Lufthansa Group flying through Cologne, but it handed over this responsibility to the airport authority for the 2022-23 winter season.

De-icing is undertaken by a fleet of eight Vestergaard Elephant de-icing trucks: six Elephant BETA Flex-liners and two Elephant BETA-15s, these latter vehicles having an extended telescopic boom with a cabin level of up to 15.5m (50 feet) off the ground; the spraying nozzle reaches to a height of more than 25m (82 feet).

Cologne Bonn uses these vehicles in 'single-operator' mode, the operator being able to also drive the vehicle from the upper cabin.

The trucks, which work in pairs, approach an aircraft from the rear and position themselves between the machine's tail and wings before beginning a de-icing procedure that can in many cases take less than five minutes. This is typically the case for de-icing in situations of "active frost", says Ipek, similar to when somebody de-ices their windscreen before driving on a cold morning.

Where snow has also built up on wings and other surfaces, the full de-icing procedure can take much longer, perhaps over 20 minutes, if the snow has reached depths of 10cm or more.

Unlike at Toronto and Memphis, Cologne Bonn Airport does not at this time have any way of collecting run-off de-icing fluid and potentially seeing it recycled, though this is something the airport authority would love to be able to do and continuously considers how it might be achieved.

EFM at work; credit EFM

Likewise, Flughafen Köln Bonn is encouraging and facilitating the use of greater numbers of electric GSE on its apron, and the Ground Services Division can certainly envisage a time when electric de-icing vehicles will be employed; just now, the technology available is not quite right for them, however, Ipek informs.

The airport's de-icing unit works over shifts to cover Cologne Bonn's 24-hour operations schedule. Most de-icing is undertaken at night (including on the freighters of UPS and FedEx), when it is coldest, and in the early morning during the initial rush of passenger aircraft operations. Between 1 or 2am and 8am is the busiest period for de-icing, Ipek confirms. A total of more than 110 aircraft have been de-iced in just one 24-hour period of frequent snowfall and cold conditions.

Employees on the de-icing team are redeployed to other duties at the airport once the winter season is over. ■

De-icing a Star Air aircraft at Cologne Bonn

The specialist manufacturers

A number of GSE manufacturers offer various de-icer units, some of which have been mentioned in this feature.

The thoughts of de-icing vehicle suppliers such as Vestergaard, Textron GSE and Mallaghan on the de-icing market as well as their insights into other important aspects of airside operations can be found elsewhere in this issue of Airside International. ■

ENGINEERING A GREENER FUTURE

Vestergaard Company produces and provides equipment which is:

- Designed to minimize environmental footprint
- Developed to use the latest, innovative technology
- Optimized to use less fluid and less fuel
- Built to ensure safety

WE CARE

New leading-edge technology as well as sustainability is given high priority in order to provide our customers with state-of-the-art equipment that is both efficient and reliable for the environment in which it is designed to operate.

CONTACT US
Head office (Denmark) +45 4642 2222
sales@vestergaardcompany.com
Scan the QR-code for more contact options

COMPANY VESTERGAARD

Visit www.vestergaardcompany.com

Swedavia has access to a large fleet of snow-clearing vehicles

Keeping airports open

It's a big job, ensuring that airside areas are kept clear of snow and ice so that aircraft can keep flying through airports. ***Mike Bryant*** talks to just a few gateways about how they go about this essential task

Ted Stevens Anchorage International Airport in Alaska gets plenty of snow: a lot of snow! And to deal with it, says airport director Craig Campbell, the gateway has a "tremendous snow removal team".

The airport has won numerous awards for its snow (and ice) clearance performance. It won the Balchen/Post Award for its team's performance in 2022, for example.

A selection committee of industry experts commended Anchorage on its ability to clear snow from its 5,000-acre site, a capability that was particularly noticeable in December 2022 when no less than 42 inches of snow fell in just eight days, and again at the start of 2023.

In fact, Anchorage Airport has actually won the Balchen/Post award seven times and it has never closed for snow or ice.

The gateway has even been showcased in the series Ice Airport Alaska on the Smithsonian Channel. Filming is scheduled to begin on a fifth Season this month (November).

This year, Anchorage Airport has also been recognised by Alaska Governor Mike Dunleavy for the hard work and exceptional performance of its snow removal team, winning the state award for Exceptional Team Performance.

The team's efforts enabled the airport to stay operational during the worst of the winter weather, even though adaptability and flexibility were certainly required – aircraft were parked on taxiways and plenty of other thinking outside the box was necessary to cope with the December storms.

Challenge

Joshua Briggs, the airport's airfield maintenance assistant manager, offers detail on the nature of the challenge to keep Ted Stevens Anchorage International open in the most severe of Alaska's winters.

"We clear snow from 33 million square feet of pavement on the airfield," he says. "Plus, we maintain 64 lane miles of roads

that are part of our campus here at the airport and over a million square feet of parking lots."

But: "The biggest challenge we face is rain events during the winter. If it's cold, we get snow that is easier to control compared to rain that freezes as soon as it hits the ground.

"We pre-treat the surfaces and then it's a continuous application of chemicals, either liquid or solid."

Depending on the month, Anchorage may undertake snow removal every day. December and January are the snowiest months; last December, Briggs notes, the airport operated its snow clearance equipment continuously for more days than it ever had previously.

The average annual snowfall at Anchorage is 76 inches but last year there were a total of 107 inches. "Our crews worked 11 days straight to keep the airport open during the month of December," Briggs recalls.

Sweeping and blowing

So how does the Anchorage snow clearance team go about its work? "We use six ploughs and brooms that offset from the [runway] centreline out," Briggs says. "Then a snow blower is run behind them that casts the final berm of snow outside of the lights.

"Behind that we run two sand/chemical trucks to apply either chemical or sand, depending on the type of precipitation we are receiving. In some cases, we would have a liquid chemical truck spray the area that has been swept.

"We treat one runway, then move on to the next. This must be co-ordinated with the air traffic control tower when we are switching from one runway to another.

"While travelling from one to the other we will sweep and treat the taxiway we are traversing to get to the next runway."

Anchorage Airport has 51 snow clearance operators, 19 of them seasonal workers. They are divided between three shifts

and they stay on their assigned shift from October until April.

The seasonal employees return to other – usually construction-related – work in April. The airport also has 17 labourers who take care of pavements, 14 mechanics who maintain the equipment and 10 electricians who look after the lighting and signs on the airfield.

The regular clearance shifts are supported as and when necessary. For example: "Our mechanics are trained on snow removal equipment and procedures, so they can also assist during large events when the extra help is needed," Briggs informs.

In terms of equipment, the airport has 13 plough and broom combinations, five sand trucks, three liquid de-icing trucks, 10 snow blowers and 11 large loaders with large push blades used on the ramps.

"We replace each piece of equipment as it ages or times out," Briggs reports. "So, we typically get something new each year and sell the older equipment at auction.

"We have MB ploughs and brooms, different brands of sand/chemical trucks, Tyler Ice liquid de-icing trucks and MB snow blowers.

"We still have some Oshkosh equipment but that is getting replaced over the next few years."

Snowy Sweden

Swedavia is the Swedish state-owned company that owns and operates 10 of the country's busiest airports.

The biggest of these is the capital's Stockholm Arlanda Airport, which has no less than 3 million square metres of area to keep clear of snow – made up of some 563,000 square metres of runways, 1.215 million square metres of taxiways, 1 million square metres of apron and 210,00 square metres of various other types of area that must be kept snow-free.

Ali Sadeghi, chief asset officer of facilities and systems at Swedavia Airports, reports that Stockholm Arlanda Airport has an "excellent record of dealing with snow".

He observes: "We have never closed the airport due to snow in 50 years and we take a lot of pride in that track record.

"Our mission is to keep operations running, but most of all we have to measure and report the actual conditions at the airport to make sure that all operators have all necessary data to perform operations safely."

"One challenge," he explains, "is to be one step ahead in operations to make handling and turnaround as smooth as possible. In order to keep the airport operational during the Swedish winter, the key word is collaboration – particularly between our snow coordinator and all other functions at the airport, with priorities based on the current traffic picture."

Of course, amongst the top priorities for airside snow clearance is keeping the runway in use operational, as well as the taxiways serving that runway, aprons and parking stands as required, plus the

Swedavia, a biogas-powered snow-clearance vehicle

emergency routes from the airport's fire station to all areas.

Next in priority come additional runways and taxiways, as well as relevant airside access routes, while other important elements that need to be kept clear of snow include the infrastructure leading to and from the airport.

At Arlanda, snow removal is carried out by teams that clear specific routes at intervals of between 35 and 60 minutes.

These routes will vary depending on the prevailing weather and traffic. Each team is led by a snow removal supervisor, who has direct contact with the airport's air traffic control tower.

When ploughing the runways at Stockholm Arlanda Airport, up to eight vehicles will operate in formation.

The vehicles can plough, sweep and blow the gateway's 3,300m longest runway clean in about 10 minutes. Each machine shoves snow to the vehicle behind it and ultimately off the edge of the runway.

The drivers follow their manoeuvres precisely so that air controllers, who also know the routines, can time arriving and departing flights down to the minute, Sadeghi explains.

The depth of snow to be cleared can range from 50cm to 220cm. A 2cm snowfall on the terminal aprons means that some 1,200 lorry loads must be carried to the airport's snow dumps.

There are two snow dumps at Arlanda that together can contain up to 750,000 cubic metres of snow.

Personnel and training

Stockholm Arlanda Airport's field maintenance team increases from a complement of 40 employees in the summer to nearly 110 snow clearance employees during the winter season.

This latter outfit works in five teams of between 18 and 45, each in 12-hour shifts, 24 hours a day and seven days a week, between October and April.

The winter season at Arlanda gets underway as early as September, with a three-week training period in place for the snow clearance teams.

Recruitment for new seasonal winter employees starts as soon as one winter season is over to make sure that Arlanda has the right competence for the following season. Interviews as well as assessments are carried out, Sadeghi informs.

He notes that Swedavia has its own training academy at Arlanda for snow-clearing personnel. "The academy trains our newly recruited seasonal workers for three weeks," he reveals.

"They are trained on the machines, routines, our work schedules, radio and airport familiarisation.

"The seasonal workers that return year after year follow a training plan and get trained according to that. They also get updated in changes in routines, methods as well as in other changes at the airport that have affected the winter operations."

Finally, says Sadeghi, "Arlanda has a 'start-up day' for all teams when we also invite higher management at the airport and other people that can give us the latest updates and information about what is new and upcoming in terms of new operators, new investments, changes of any kind, etc."

Going green

Swedavia has been fossil-free in its own operations since the end of 2020, Sadeghi states. As such: "We are also continuously pushing producers of heavy machines to invent bigger, better and 'greener' vehicles.

"A few years ago, we switched our biogas PSBs [combined plough-sweeper-blower vehicles manufactured by Vamma of Finland] for newer and larger biodiesel PSBs."

The PSBs clear surfaces in three steps: they plough, sweep and blow the snow. In addition to the carbon reduction they offer compared to conventional diesel-powered vehicles, these PSBs represent a reduction in fuel costs and a standardisation of the vehicle fleet that results in lower maintenance costs, Sadeghi declares.

Arlanda uses about 100 different vehicles just for snow clearing. On its runways and taxiways, the PSB vehicles are used, followed by an anti-skid spreader, snow blowers and friction test cars.

The line of snow left behind by the PSB machines can weigh about 120kg per metre, so Arlanda's snow blowers have a high capacity; in fact, they can handle between 7,000 and 8,000 tons of snow per hour, and blow snow banks 40-50m off the runway while operating at a speed of 25-30km/hour.

The de-icing spreader places a 40+ metre-wide path of anti-skid agent on the runway. At Arlanda, the agent used is potassium formate and consists of organic formic salts that decompose naturally.

Plus, on apron areas and stands, Arlanda employs 10-15 front-wheeled loaders of different sizes.

"When clearing snow at Stockholm Arlanda Airport, our goal is to occupy the runways and taxiways for the shortest time possible," Sadeghi says.

"We want to achieve good friction values [for safe operations on these surfaces] and leave as little contamination as possible. Therefore, it is crucial for us to have reliable, environmentally friendly and efficient machines to work with.

"To succeed in this, good cooperation between us and equipment manufacturers is key."

*Swedavia's **Ali Sadeghi***

Swedavia has ordered over 20 new snow sweepers. These vehicles, which are more than 17m long, are equipped with ploughs weighing nearly 30 tons. The sweepers will clear snow at a speed of 25-40km/hour.

"The machines are crucial for our operations and need to perform at their best with minimal downtime. Every failure means lost capacity," Sadeghi points out.

A few years back, Swedavia bought 20 new PSBs from Överaasen. RS400 models, these vehicles are equipped with modifications to enable them to work autonomously at the airport.

"In close cooperation with Överaasen, we are striving to implement these functions in coming winters," Sadeghi says.

A big job

Frankfurt Airport, one of Europe's biggest and busiest air hubs, has more than nine million square metres of area that must be kept clear of snow. As well as publicly accessible areas of roads and pavements and parking areas, that figure is made up

Snow clearing at Anchorage

UNLEASH EFFICIENCY: INTRODUCING THE GAME-CHANGING PUSHBACK TUG!

VISIT US ...

SINGAPORE AIRSHOW

Singapore Airshow
Feb 20–25 2024
Singapore

FULLY ELECTRIC DRIVE

REMOTELY CONTROLLED

HANDS FREE LOADING & UNLOADING WITH A TAP ON THE RC

NEW SPACER 8600 NG

Also suitable for Airbus A321 NEO LR / XLR

More Information & Videos:
www.mototok.com/8600ng

The new SPACER 8600 NG – the success story continues ...

This represents the consistent further development of our SPACER 8600 pushback tug, now regarded as state-of-the-art among compact pushback tractors in terms of technology, economy, and ecology. The Spacer 8600 can be found at numerous airports and delivers its service without issues, operating exceptionally efficiently. This is demonstrated daily at British Airways in London Heathrow T5A, as well as at Iberia in Madrid and Barcelona, where our Mototok tugs have completed more than 900,000 pushbacks.

The further developed SPACER 8600 NG boasts several features that further simplify operations on the tarmac. For example, it includes an onboard charger with a CEE plug, allowing easy charging wherever an industrial socket is available. Furthermore, it is equipped with an on-board tow bar that enables swift relocation.

Our towbarless tug is compatible* with the most important short-haul aircraft like

- → Airbus A320 Family incl. 321 NEO LR/XLR
- → Boeing 737, Boeing 737 MAX
- → Embraer E-Jets
- → MHI / Bombardier CRJ

There are many other technical innovations that we would like to present to you in a personal conversation – so get in touch with us.

* NTO already implemented or in progress

Onboard charger with self retracting cable

mototok
easy moving

Innovative remote controlled electric driven tugs

Contact us: +49-2151-65083-82 · www.mototok.com · info@mototok.com · fb.com/MototokTugs

of 4.9 million square metres of apron area, 2.34 million square metres of taxiways and nearly a million square metres of runway, all of which has to kept free of snow for the airport to operate safely and efficiently.

The airport's operator, Fraport, estimates that 10cm of snowfall on runways, taxiways and apron areas is equivalent to some 114,000 tonnes of snow that has to be cleared, or approximately 6,000 truck loads.

It's a good thing, then, that there is a large fleet of vehicles available for snow and ice clearing available to the airport operator. Fraport points to a total fleet consisting of:

- 107 trucks
- 4 snow blowers
- 51 runway sweepers
- 30 command vehicles
- 14 telescopic loaders
- 24 spreading vehicles
- 42 snow clearing tractors
- 5 runway friction testing cars
- 65 de-icing trucks
- 5 de-icing fluid removal trucks

A single snow clearing convoy of up to 21 vehicles is deployed at Frankfurt to clear snow – a formation as wide as would fully occupy an eight-lane motorway.

Usually, clearance takes up to 30 minutes per runway, including friction testing. However, it can take longer than an hour when heavy snow falls continuously for six hours or longer.

On the alert

As soon as Germany's national meteorological service forecasts snow, Frankfurt's Winter Services team is alerted.

If there is little likelihood of snowfall lasting more than six hours then the team goes on duty while airport operations continue as usual. If there is a high likelihood of such snowfall, then the team goes into operation.

Moreover, the Emergency Response and Information Center (ERIC) which incorporates all relevant parties involved in Frankfurt flight operations is activated to evaluate the situation and decide on the appropriate action to be taken.

On a more strategic rather than day-to-day level, a Fraport spokesperson advises that as soon as winter operations end at Frankfurt Airport (by late March usually), preparations for the next season begin.

"Management takes stock. Do we need more staff, vehicles, de-icing agents, etc? Do we need to change workflows?"

Plus, planning and scheduling of training for the next season begins. Extensive theoretical training sessions run throughout the year, the spokesperson says.

In summer, when temperatures on the apron rise to 40 degrees Celsius, the ground winter services team undergoes its first practical operational run.

"Four full rehearsals in November ensure well-studied process flows and smooth operations. The aim is to familiarise all team members with the various special-purpose vehicles and to study the clearing concepts for the runway system in depth," the spokesperson explains. ■

A team photo from Anchorage Airport a couple of years back

Track your GSE and optimize your Ground Operations in real time with

XOPS - ***SMART*** Airport Asset Solutions

- Fleet Management System
- Operations Management System
- Data Management System

To Make Your Asset Intelligent

Contact Us

www.xops-aero.com

info@xops-aero.com

+33 6 74 68 77 74

+44 208 757 5654

XOPS

OPerations on Screen

***Thilo Wiers-Keiser** poses in front of Mototok's stand at inter airport Europe 2023*

'Great potential' ahead for Mototok's new, remote-controlled tug?

***William Hallowell** interviews Thilo Wiers-Keiser, owner and sales director of Mototok, on the German manufacturer's new remote-controlled aircraft tug at inter airport Europe 2023*

Why is Mototok here at inter airport this year, and have you got any new products in development?

inter airport has been an established event in the calendar for many years, with excellent attendance from OEMs, ground handlers, airlines and airports – and attendees come from around the world, making it easier for us to reach out to so many existing and potential customers.

We are also showcasing our latest spacer, the 8600 NG, which is our best-selling NBA pushback – an electric, remote-controlled tug.

We have received very positive feedback from our customers on this very innovative and advanced multi-aircraft pushback.

It is A321 XLR enabled, with advanced drive motors, traction control tyres, an onboard charger and tow bar. We have several battery options to suit customer requirements.

How many units of the new spacer have you sold so far?

We are potentially looking at 20 units so far with several discussions with airlines and ground handlers.

Which markets have shown interest in the 8600 NG?

We have seen very positive interest from the North American and Asian markets. We will be launching a marketing campaign in South America in the New Year and we see this as a big potential for electric GSE.

We have [already sold] units in Japan and in Singapore. In Malaysia now we have the first customer for this type of machine.

We have been very successful in Europe, so we have seen interest in markets globally.

Today, everyone needs electric machines, and our concept for pushback tractors is especially interesting because it saves manpower, money for maintenance and servicing, and you have much more flexibility with your staff because it's easy to learn and train many more people to operate the pushback. So, there are many arguments for our machines.

What makes your new pushback unique?

We have maintained our core concept from day one – an electric, remote control operated pushback tug, which is compact in design.

It is also a one person enabled operation, making the pushback process resource efficient.

Having the operator on the outside

provides another layer of safety with direct contact with the flight crew, avoiding communication distortion.

The spacer allows for significant savings in training, it has a small footprint and we can monitor all our machines remotely from our hub in Germany, which helps us to provide technical support directly to the customer.

If you look at the machine, you see immediately that it's small – it's not so big, not so high.

And it has no driver's seat because you have a remote control, so you walk with the unit.

We have designed it this way because when you have the remote control in your hand, you have a very good overview of what you're doing, you're staying maybe 10 to 15m away from the cockpit and you have a wide range of view [in terms of] what's happening to your left and right and behind the aircraft.

Are remote-controlled pushbacks becoming more popular with airports?

There is a far greater awareness and excitement about our remote control operated electric aircraft pushback tugs around the world. Our next step is to work on a hub-controlled operation.

There is also a far greater acceptance of new technology like our products around the world and airports are very supportive now of this change.

Can you give an idea of how many units of the spacer Mototok is expecting to sell?

Several potential customers are in discussion with Mototok, and we feel confident about our future.

There is certainly a potential for exponential growth. We are very excited about these challenges.

British Airways operates 28 machines at London Heathrow with excellent success in NBA pushback with significant punctuality improvements.

Their concept of having a Mototok tug on each gate is proving very successful on many fronts – safety, punctuality, resource efficiency, and reductions in emissions, noise and training requirements.

And in terms of Mototok as a whole, where are your biggest markets at the moment and where would you like to see more growth?

We are working on potential growth in the US markets with imminent realisation in Asia and Europe.

The Middle East and Africa are also in our focus. In Africa, I think this concept is maybe a little early for them but we will look at these markets in future.

Post-pandemic, most airlines and ground handlers are still suffering with resourcing issues, hence technology like ours is receiving greater prominence. Our product is also proving to be very successful in MRO markets.

Are you focusing more on commercial or business aviation at the moment?

In its infancy stage, Mototok started with small, electric, remote-controlled tugs for moving small aircraft.

Since then, we have developed tugs of varying capability for the defence sector, business jets, FBOs, MROs and commercial aviation.

Mototok is well recognised by aircraft manufacturers like Airbus and Embraer as they also use tugs. We are very competitive in both commercial and business aviation. ■

Mototok's new pushback, the Spacer 8600 NG

Higher standards for recruitment and training are key to remodelling post-Covid operations

John Musson, managing director of Muss Group, says inconsistent levels of recruitment and training creates a dangerous culture within airport operations

Providing training for all operational and safety functions, the expert, who has more than 26 years' experience, has launched a new aviation support service company aimed at improving standards across the industry and ensuring operators are "safe, competent and compliant".

He explains that the Coronavirus pandemic has had a significant impact on staff numbers across the industry, and that this has also resulted in the "dramatic" loss of experienced professionals and instructors to train new starters joining the industry.

Musson estimates that Covid cost the industry almost 46,000 staff members. "That's an incredible amount of knowledge and experience lost," he says.

"We have no choice but to take the industry back to factory settings and forge new paths.

"It will take us years to backfill the experience we lost and we need to be certain we are onboarding the correct people."

The managing director adds that his company's innovative, assessment-based recruitment process allows them to support airports, operators and service providers in sourcing the correct people.

He says Muss Group is designed to "provide a robust service in getting this right first time, as we understand what the impacts of bringing the wrong people into the industry are".

This is the most efficient way of recruiting operational staff, he highlights. Once accepted, "our team is then able to reference, vet and train new staff so they are of immediate value to our customers' operations".

Having been appointed to develop training programmes throughout his career, the previous training director launched Muss Group earlier this year – an opportunity he says gives him the chance to "roll my sleeves up" and "give something back to the industry".

Musson explains: "What makes our training different is that we don't just offer eight-hour classroom sessions and then hand new staff over to clients to go straight into the operation.

> ***"Our business motto is 'your operation is our priority'. We are dedicated to customer quality and continuous improvement"***
>
> ***John Musson**, managing director of Muss Group*

"We also complete practical demonstrations, follow up assessments and then final sign-off as well. The assessment-based training process is also applicable to existing staff during recurrent training, where possible.

"By performing one-to-one assessments within the operation, it allows us to provide the highest standard of training as it is within the environment they will be comfortable in."

The expert believes that in order to drive up standards, regulatory and legislative mandates are vital for training.

He adds that corners start to get cut during operations when there are shortfalls in training: "If you fall short of that training element, that's when a dangerous culture sets in".

To circumvent the problem, Musson aims to take a "holistic" approach by ensuring his company can deliver the best standard of training as opposed to simply spending hours in the classroom.

He explains how he has identified common inconsistencies that are occurring – a contributing factor to the creation of Muss Group.

The company has already partnered with various airports in the UK and is continuing to build up its client portfolio. Muss Group is currently in the process of engaging with "all UK airports, operators and service providers".

Musson adds that his immediate plan for the new business is to "spread the word that there is a new service provider that has taken a fresh approach to aviation recruitment, training and business resilience".

He says: "With our business resilience division, we are able to support airports, operators and service providers in operational and commercial projects.

"This currently ranges from supporting baggage drops, creating bespoke training packages or establishing standards. We can also support with nonconformance against regulatory directives.

"Our business motto is 'your operation is our priority'. We are dedicated to customer quality and continuous improvement."

Meanwhile, in thinking about the long-term vision for Muss Group, the managing director explains that he wants the business to be the number one provider for each of its divisions in recruitment, training and business resilience. ■

MUSS GROUP

Las Vegas rendezvous

This year's International GSE Expo was held at a new venue in Las Vegas: the Las Vegas Convention Center. ***Mike Bryant*** writes that it was a great setting for the ground support business to come together once again and see the latest that this industry has to offer

The International GSE Expo is promoted as "The premier event dedicated to the advancement of the ground support equipment industry". And this year's show, held between 26 and 28 September, felt like the biggest so far.

According to the organisers, there were 2,856 verified attendees, keen to pore over the wares displayed at no less than 215 indoor and outdoor stands.

Over 21% of attendees were described as suppliers, manufacturers or distributors, with nearly 18% coming from airlines. Contractors and service providers formed another important element of the mix, as did representatives from governments or military forces. Airport operators, fixed-based operators and even consultants were also present.

Electric options

Unsurprisingly, a key theme of the International GSE Expo was sustainability. The industry is working to improve its performance in this area in various ways, including of course the increased use of electric and hybrid equipment on the ramp.

JBT AeroTech, now part of Oshkosh Corporation, welcomed visitors to its stand to talk about how it will move forward under the wing of its new owner, show off the wide range of JBT AeroTech equipment on display, and release some news concerning both Oshkosh and its new subsidiary.

Dallas/Fort Worth International Airport (DFW) has ordered six Oshkosh Airport Products 6x6 Striker Volterra aircraft rescue and firefighting (ARFF) hybrid electric vehicles.

Oshkosh Airport Products, a division of Pierce Manufacturing Inc, is – like JBT AeroTech – a subsidiary of Oshkosh Corporation. The six hybrid vehicles will form part of DFW Airport Fire Department's new ARFF fleet, replacing eight conventionally powered Striker 8x8s.

The Striker Volterra 6x6s will be complemented by two Striker 6x6s, both equipped with a Snozzle High Reach Extendable Turret (HRET), and two Striker 4x4 rapid intervention trucks.

New foam standards, combined with the US Federal Aviation Administration's fluorine-free aircraft firefighting foam transition plan, are important

considerations in the fleet revamp.

But Daniel White, chief of the DFW Airport Fire Department, emphasised: "Our choice to transition to the new Striker Volterra ARFF hinges on performance. These vehicles are faster, more agile, and quieter as compared to our current fleet, benefiting from both carbon and diesel savings.

"While our commitment to supporting the goal of net-zero emissions remains robust, functionality and safety of our personnel remain paramount."

The Striker Volterra vehicles are equipped with an Oshkosh-patented hybrid-electric drivetrain that comes with an electro-mechanical infinitely variable transmission. This enables zero-emissions operation through the integrated onboard batteries and uninterrupted power supply by coupling with the internal combustion engine for pumping and drive systems.

Regarding the availability of charging infrastructure, White informed: "Our ARFF stations will soon undergo modernisation. While the Striker Volterra ARFF vehicles come with onboard chargers, we're ensuring sufficient power delivery. Our new stations will be future-proofed with 480V power service, offering adaptability for evolving charging needs."

The Oshkosh Volterra ARFF will be operated at DFW

White's colleague Ed Sachs, engineering manager for tractors, discussed the B80 heavy baggage/light cargo tractor and the B250 pushback on the stand.

There are about 150 B80s (in gasoline-powered form) in operation on airside ramps, Sachs informed, most of them in the US market. An electric variant is already for sale.

The B80 heavy-duty tractor features front and rear suspension configurations, combining the ride of a passenger vehicle with the toughness of a designed-for-purpose ramp cargo tractor.

It has a top speed of 20mph (32kph), a draw bar pull of 5,750lbs (2,608kg), and a unit weight of 7,900lbs (3,583kg).

The B80 is a very simple but very robust vehicle, Sachs said.

The B250 pushback tractor has a top speed of about 27kph (17mph) and weighs in at 30,000lbs (13,608kg). It is ideal for handling narrowbody aircraft such as B737 and A320 family aircraft.

The B250 has a low-profile design, is robust and features reliable components with easy-access maintenance. Indeed, Sachs said the model has "car-like drivability characteristics".

The lithium-ion-powered variant shown on the stand was developed last year to complement the standard diesel design. (Other JBT AeroTech pushbacks will also include Li-ion variants; for example, a battery-powered B950 pushback will launch next year.)

The electric B250 can undertake 12 pushbacks and drive up to 30 miles on a single charge of its 66kWh-capacity battery.

Also on the stand was a JBT AeroTech Ranger, on its way to a current customer.

The Safeaero 220 de-icer was on show on the Textron GSE stand at the recent International GSE Expo in Las Vegas

Bobby Gray, product engineering manager responsible for loaders, described it as "one of a kind".

Unlike other older loaders – the Ranger was launched in 2016 – it was "designed to be driven", Gray declared, making it ideal for those operators who might need their loaders to serve different gates.

With a top speed of 15mph, it is the fastest loader of its kind in the market, Gray said; it also has a very smooth ride supported by suspension on both axles.

The electric Ranger has two 50kW motors, one for driving and one for hydraulics and loading operations. Regenerative braking helps minimise power consumption. The batteries are of the thermally stable lithium iron phosphate kind.

Elsewhere at the International GSE Expo, Textron GSE had a large stand area in the outdoors exhibition area, where it showed off many of its latest products, including a Samsung lithium-powered TUG 660 Li belt conveyor. Part of Textron GSE's concerted effort to support the aviation industry's move towards a more sustainable future, the 660 Li is new this year.

Amongst other units on display was a TUG Endurance™ lithium-ion-powered baggage tractor launched last year. The one on the stand was in the cab aft configuration, but the TUG Endurance is also available in a cab forward configuration to suit different user requirements.

The Li-ion battery can power the unit for two full eight-hour shifts without top-up, explained Jo Uhles, Textron GSE's US-based marketing representative. It's a "no-maintenance battery", she added, which cuts down on costs and operator training in that regard.

The TUG Alpha 1

Also on display was a TUG™ ALPHA 1 pushback tractor, an example of the model that was launched in 2020. The unit on display was a lithium-powered variant, but the tractor is also available in gas-powered form and is the only one of its size ideal for towing narrowbody aircraft, Uhles said.

The TUG ALPHA 1 has a modern cabin design with 360-degree visibility owing to the driver/operator position just behind the locking pin. Optional extras available on the model include link pin connection sensors.

The only diesel-powered unit on the stand was a Safeaero 220 de-icer. The one-person operation of this model cuts down on costs, while it also benefits significantly from Textron GSE's Intellimix technology.

Textron GSE's TUG Endurance

Challenges

Wiesbaden, Germany-based COBUS is well known as a respected provider of high-end airport buses, and has sold about

150 electric buses into operation around the world – a small number compared to the 5,000 or so diesel variants it has produced, but a number that is growing fast nonetheless. Indeed, CEO/managing director Patricia Vasconcelos estimates that within a couple of years there will be more electric COBUS vehicles rolling off the assembly line than their diesel variants.

Electric buses rely on their installed computer software in a way that diesel vehicles do not. And this technology remains relatively unfamiliar to many new users – hence the need for easily accessible remote support, Vasconcelos considered.

Moreover, COBUS can analyse the large amounts of data produced by e.COBUS vehicles' built-in telematic capabilities in order to proactively help operators maximise the efficiency of the vehicles while minimising downtime and total cost of ownership.

Electric vehicles also come with challenges that diesel vehicles do not. Most obviously, their batteries need regular recharging. An e.COBUS operating at an average-sized airport on typical rotations can go for eight to 10 hours without a recharge, but this can be significantly affected by all sorts of variables, not least the use of air conditioning within the vehicle in hot climates or the use of interior heating in cold climes, both of which drain a vehicle battery comparatively quickly.

Given the increasing popularity of electric vehicles, with their different challenges, COBUS has created a new, interactive customer service concept, Vasconcelos said. One manifestation of this is COBUS's REAL (Remote Expert Assistance Life), a virtual reality (VR) tutoring service for those who are looking to maintain or repair their own COBUS vehicles and who have the appropriate VR glasses.

More generally, "We make it easy for operators to contact us and for us to help them remotely," said Vasconcelos.

Similarly. Textron GSE recently relaunched its website to offer improved user tools and greater ease of use. The new site includes, for instance, an online calculator of the savings that Textron GSE's TUG Endurance lithium battery-powered model offers compared to a similar diesel model.

The e.COBUS 3000

Another company making its green credentials very clear in Vegas was TLD (part of the wider GSE business Alvest), which displayed a wide range of GSE on its stand – all of it electric. The equipment took in TLD's NBL-E electric belt conveyor, electric air start unit (ASU), small electric ground power unit (GPU) and even its large, high-speed, fully electric towbarless electric tractor, the TPX-200-MTX-E.

The GPU is able to charge other GSE if it has spare capacity – including units that might be as large and power-hungry as a pushback. And, as Yves Crespel, group communication director at Alvest, said: "Being able to charge other GSE on the ramp really helps."

As well as a wide range of fully electric GSE, TLD also offers hybrid variants and is producing models that, while in diesel form, are built such that the power train and other relevant parts can easily be replaced by an electric battery and its associated supporting elements to make TLD GSE 'future-proof'.

All of this effort supports TLD's firm commitment to end all production of GSE based on an internal combustion engine by 2025. It will continue to support operators of TLD diesel equipment beyond that time but, in a significant statement of green intent, it will cease to manufacture new diesel GSE.

Vasconcelos noted that battery and charging technology is getting better all the time, and there is another potential solution on the horizon: hydrogen fuel cell technology. COBUS is very interested in this (see https://www.airsideint.com/cobus-hydra-presents-first-hydrogen-driven-airport-bus/ on COBUS's Hydra bus, for example) and Vasconcelos hopes to have a hydrogen cell-powered bus available for full operational testing within a couple of years.

Use of hydrogen means much lower charging times and requires only one type of filling station on or near an airport, rather than electric charging points in different locations – although hydrogen of course comes with its own issues, not least the need for a whole new system of infrastructure for refilling hydrogen cells.

TLD and Alvest are also looking into

the potential for hydrogen fuel cell technology, Crespel noted.

Meanwhile, TLD's involvement in the TaxiBot programme continues to bear fruit. TaxiBot is a semi-autonomous tow tractor system controlled from an aircraft flight deck that enables aircraft to taxi without their engines running.

Tests have been successfully completed in locations such as Amsterdam and Mumbai (indeed, TaxiBot is today in commercial operation in India), and it is also to undergo testing at Paris Charles de Gaulle (CDG) and New York JFK airports.

Winter is coming

With the Winter season fast approaching in the northern hemisphere, de-icers were a particularly apt feature at the Las Vegas gathering.

Textron GSE offers aircraft de-icing units designed to support de-icing operations of all sizes and all kinds. Matt Chaffin, vice president of Textron GSE, explained that such equipment is a key component of its diverse product range – and examples of this portfolio were on display in Vegas.

Textron GSE's acquisition of de-icing equipment supplier Safeaero in 2016 "further solidified the organisation's market position, firmly establishing aircraft de-icing equipment as a core element of [Textron GSE's] product line", Chaffin said.

Its standout product, the Safeaero™ 220, holds a "unique distinction as the industry's only true one-man de-icer. This innovation proves valuable for busy airports that prioritise efficiency," Chaffin suggested.

"Conversely, for smaller operations, the Safeaero Typhoon open-basket two-man de-icer serves as a suitable alternative."

Textron GSE's offering also includes the Premier™ de-icer range, which supports de-icing operations of all sizes.

Textron maintains an ongoing commitment to enhancing its product range through technological developments, Chaffin declared, and: "Along with Intellimix™

TLD's TPX-200-MTX-E electric pushback tractor

technology, a notable advancement in fluid systems [of which more below], Textron GSE has innovated an infra-red camera option and aftermarket retrofit solution.

"These additions serve as tools that empower customers to enhance the efficiency of their de-icing operations."

For Premier de-icers, the incorporation of Express Start™ and Guardian™ technology stands out as "a significant improvement [and] these innovations have effectively elevated reliability, performance and overall efficiency across the range of Premier de-icers", Chaffin said.

According to Chaffin, Textron GSE has observed "notable enthusiasm surrounding its Intellimix technology", which eliminates the need to flush de-icing fluids by circulating heated fluids and mixing them at the vehicle's nozzle. This results in cost savings along with a significant reduction in environmental waste.

Chaffin stated: "Textron GSE is committed to sustainability with its goal of having at least 75% of its product range operating with fully electric or hybrid powertrain options.

"The development team has taken note of the increasing demand in the GSE market for green solutions in all segments, and the company is excited to bring its future green developments to the industry."

Another example of continuing improvements in the de-icing arena is JBT's Tempest-i de-icer, which now features a new cabin design (launched this year), based on the popular design of the vehicle's de-icing basket but up-scaled, said Matt Montanaro, lead senior design engineer for the Tempest-i de-icer at JBT AeroTech.

The cabin design has minimal screens and controls, keeping down the level of complexity that is perhaps a feature of some other designs, he added. Yet the levels of utility and comfort are very high, with features such as a heated windshield and skylight as well as heated seats.

The latest Tempest-i has a standardised Cummins 4.5 litre Stage 5 engine, smaller than its predecessor but offering the same level of performance.

Market changes

Of late, the de-icing market has shown a high degree of stability, Chaffin informed.

"The recent aviation downturn exerted a negative influence, not only impacting customer investments in new equipment but also diminishing the need for de-icing operations due to reduced flight activity. This led to the preservation of existing units and the extension of their operational lifespan to reduce costs."

But on a more positive note: "The consensus among industry experts underscores the indispensable role of de-icing in ensuring aircraft safety during winter conditions. As demand for air travel continues to increase, demand for de-icing equipment is poised to rise in tandem.

"Global passenger numbers are gradually approaching pre-Covid levels," Chaffin pointed out. "Airlines and ground handlers, who have concentrated on re-establishing profitability in the past few years, are now exhibiting increased demand for new equipment.

"This resurgence in demand aligns with the aviation industry's journey toward restored profitability."

The expansion of the global aircraft fleet will also contribute to rising demand for de-icers, Chaffin said.

According to marketing manager Karina Læssøe, Vestergaard Company (which specialises in aircraft de-icer units as well as aircraft washers and water and toilet service units) seeks "to lead the way in innovation and sustainability,

reshaping the landscape of de-icing operations" of the future.

The Roskilde, Denmark-based company has introduced significant enhancements to its product range, catering to the evolving needs of customers and promoting safer and more efficient de-icing operations.

During the past year, Vestergaard launched the Elephant® e-Mini MY Lite – a compact, fully electric de-icer – that is now in operation around the world. Furthermore, the electrically operated Elephant® e-BETA de-icer is now operational in more than 20 airports.

In Las Vegas, Vestergaard announced that Canada's into-plane service provider FSM Group has ordered six e-BETA de-icers for operation at Calgary International Airport, Alberta.

The six new units will complement the 12 de-icing units purchased in 2022 for use at Calgary's Central De-icing Facility (CDF). The new e-BETAs are expected to be ready for operations at the airport in the autumn this year.

The Elephant e-BETA is electrically operated and comes with a hybrid option; it has been in operation throughout Canada, the US and Europe for several years, and one of the units was on display at the Vestergaard stand at the International GSE Expo.

Also at the show, Vestergaard revealed that United Ground Express (UGE) will be the North American launch customer for two of its products: the Elephant e-Mini MY Lite and its new and refurbished e-VTS units.

Both the e-Mini MY Lite and e-VTS units are fully electric, being built on the Vestergaard e electric chassis. The Vestergaard e is available in 9-, 12-, and 20-tonne configurations, thereby providing equipment commonality for parts and improved efficiency for operators and maintenance training. A 27-tonne unit is planned for the near future.

Customers are increasingly adopting these eco-friendly solutions in line with their sustainability vision – and also because it makes economic sense, Læssøe suggested. With substantial reductions (up to 87%) in CO2 emissions and significant energy costs (over 60%) accruing for conventional equipment, "these innovations are proving to be financially smart choices as well", she said.

Looking ahead, Vestergaard Company also has exciting plans. The aim is to launch a larger open-basket de-icer, the Elephant MY, in a fully electric version next year. Within the next 12 to 18 months, the plan is also to release a fully electric variant of the Elephant® e-BETA de-icer.

"These initiatives confirm Vestergaard's commitment to revolutionising the ground handling industry with green technologies," Læssøe declared.

"Vestergaard Company has a rich history of sustainability and innovation and envisions a future where GSE does not contribute to the carbon footprint of travel," she continued. "An ambitious target has been set to achieve carbon neutrality in Vestergaard GSE by 2030. By 2025, the goal is to produce 75% of all vehicles in sustainable versions, reflecting the company's dedication to a greener tomorrow."

In addition to GSE, Vestergaard is committed to reducing carbon dioxide emissions in its production processes. Geothermal heating, featuring an extensive network of underground tanks and hoses, has been employed to heat up production and office facilities. Solar panels on rooftops generate nearly half of its existing electricity needs. Plus, Vestergaard recycles hot water from de-icer testing to heat buildings and to carry out further tests, minimising the use of precious potential drinking water.

Finally, said Læssøe, "While Vestergaard's Supply Chain endeavours to source materials with the lowest carbon

footprint, it is also acknowledged that certain components, such as steel, still present challenges in this regard.

"However, Vestergaard Company is diligently working toward comprehensive documentation of the total carbon footprint of products (Scope 3) to establish new targets for further reduction."

Beyond environmental concerns

Vestergaard Company also embraces corporate social responsibility and its vision extends to eliminating incidents and accidents in the industry by 2030. This involves proactive design, enhanced safety measures, and a focus on automation and autonomous operations.

By reducing the workload of operators, Vestergaard aims to prevent incidents, reduce labour costs and optimise operations, leading to energy savings, reduced de-icing fluid usage and minimised block time. "In a post-pandemic world where staffing challenges persist, automation and autonomous operations not only enhance safety but also enable companies to negotiate more favourable agreements and potentially improve profitability in the low-margin ground handling industry," Læssøe pointed out.

Despite global warming, the global market for aircraft de-icing is growing, attributable to increased travel and more routes and aircraft, Læssøe advised. "There is a sound interest in efficiency which is to be found in quicker operation and less waiting on the ground with running engines. A fleet of efficient de-icers is a clear step in that direction."

Nor is de-icing the only area in which the reduction of workplace injuries and incidents, as well as efficiency gains, are in the spotlight. Ramper Innovations has developed the innovative TISABAS belt conveyor that eases the process of loading and unloading aircraft cargo and baggage, for example.

The compact, motorised, folding conveyor system that mechanically moves baggage or cargo inside an aircraft belly was demonstrated at International GSE Expo for the benefit of interested potential users.

Its name comes from the premise that 'TIm SAves BAckS' – Tim Fulton being the inspiration behind the product as well as founder and CEO of Ramper Innovations, and TISABAS being designed to avoid the backbreaking strains that ramp agents can experience when loading and unloading cargo and bags.

In fact, Sitka, Alaska-based Fulton specifically wanted to ease the task of ramp agents undertaking work that not only puts severe strain on their back, 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.

While TISABAS makes life easier for individual cargo handlers, it also has significant benefits for their employers – not least in the greater speed and efficiency that it facilitates.

Less exertion means fewer injuries,

Vestergaard e-BETA de-icers at work

which is good news for individual ramp handlers, and an advantage for airlines and ground service providers seeking to attract new employees. And fewer injuries also mean less downtime.

Fulton's first, pre-TISABAS design for a conveyor was intended to make it easier to move heavy consignments of fish and took the form of a non-mechanical roller system. This design proved popular with Alaska Airlines, where he then worked, and which purchased 15 units in 2014.

But when Fulton left Alaska Airlines in 2018, he was looking to develop equipment suitable for moving baggage as well as cargo. The answer, he thought, would lie in a motorised, roller-based, folding conveyor that would be portable and robust.

When extended, TISABAS is 6.1m long, 61cm wide and just 7.6cm high. Folded, it is 60.9cm long by 53.3cm wide by 81.3cm high. It weighs 90.7kg.

The belt is powered by eight 24V motorised drive rollers (MDRs), and the system is convertible from 14V by a converter that can be attached to a regular belt loader (which normally runs off 14V).

It has four speed settings that can handle from 16 to 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.

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. Since then, the company has set up its own assembly facilities in Alaska, and fully developed TISABAS units have been sold to customers such as Aerocharter de México based in Mexico City and Malaysia-headquartered HEE Group.

Manufacturing can be ramped up as required, said Fulton, whenever new customers come on board. There has been particularly significant interest in Latin America (from major international airline LATAM, for example) as well as in the Middle East (such as with a potential customer based in Dubai).

Ramper Innovations has just completed the testing required for CE certification and has signed the appropriate Certificate of Conformity. According to Fulton, "With several companies interested in TISABAS, the unit will be starting its European tour soon."

The original market focus of North America is not forgotten. Curiosity from airlines (such as low-cost carrier Allegiant Air) and handlers (Menzies, for example) has been supplemented by enquiries from the military market (the US Air Force) and even from e-commerce giant Amazon.

Gate power

Back to power provision, and several companies at the International GSE Expo were keen to promote their solutions for apron and gate.

Kevin Cecil, engineering manager, new

product development at JBT AeroTech, proudly showed off the new AmpCart towable charging platform. The unit on the stand was in DHL livery, ready for delivery to the express services giant – its launch customer.

The AmpCart was developed as a result of conversations with customers about the need for charging GSE on the ramp. It can be towed to where it is needed by a vehicle such as a baggage tractor, ubiquitous on global aprons, and can charge no less than eight items of ground support equipment simultaneously.

It has swing arms for extending the charging points, and the 20ft cables retract automatically when they are decoupled from any freshly charged piece of GSE.

There are also break-away devices to ensure that if a GSE vehicle is driven off before it is decoupled from the AmpCart there is no danger.

For handling GSE with built-in charger units, the AmpCart has – for example – standard 480V, three-phase, 30-amp power for the US market.

A number of AmpCart units have already been pre-sold, Cecil confirmed, and there was plenty of interest in the unit at the International GSE Expo. It is useful across all markets, he continued – civil and military, cargo and passenger aircraft handlers. AmpCarts are now being produced at JBT AeroTech's manufacturing facility in Orlando, Florida.

Also on hand in Las Vegas was John Thompson, managing director of sales, gate equipment at JBT AeroTech, who explained how the new AmpTek device's load sharing technology helps minimise the cost of power provision by intelligently sharing the electric power already routed to a passenger boarding gate.

AmpTek load shares gate power with eGSE battery chargers, so that eGSE units can charge their batteries. Vitally, it also ensures that power provided to an aircraft at the gate is never interrupted.

Thompson confirmed that Southwest Airlines is expected to be AmpTek's launch customer. The technology is also being demonstrated to other potential customers and talks are being held on the design with

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

major hubs such as London Heathrow Airport and multi-airport operators such as Spain's Aena.

Odense, Denmark-headquartered ITW GSE is supplying another way of managing power provision to GSE at aircraft gates

WELCOME to Goldhofer in Poland

Memmingen, Germany-headquartered Goldhofer Airport Technology announced at the International GSE Expo in Las Vegas that it has continued to grow its business with Poland's WELCOME Airport Services.

WELCOME Airport Services is one of Poland's largest ground handling service providers, and has been providing ground and passenger handling services for almost 25 years. Today, it is active at eight Polish airports.

In addition to Goldhofer's SHERPA cargo tow tractors and BISON D370, D620 and D1000 conventional tow tractors, WELCOME took delivery of a Goldhofer PHOENIX P towbarless aircraft tractor in May.

*WELCOME Poland's logistics director **Marcin Klejdys** and procurement manager **Pawel Golan***

"The PHOENIX towbarless tractor enables us to respond even faster, more effectively and more economically to the strong resurgence in traffic volumes at Polish airports," informed Marcin Klejdys, logistics director ftor WELCOME.

WELCOME will also be responsible for servicing and maintenance work on Goldhofer's equipment, both for its own fleet and for other GSE operators that use Goldhofer vehicles and who are interested in outsourcing their tasks in whole or in part.

According to Goldhofer, WELCOME has a "well-developed workshop network [and] also carries an extensive stock of spare parts, so that any repairs can be carried out quickly and efficiently". ■

– and is attracting a lot of interest in its EcoGate concept.

Alberto Rocha, sales director, Americas for ITW GSE said that since Covid, things are "getting back to business as usual" despite continuing global challenges such as strained international supply chains for many products and components.

ITW GSE is seeing plenty of demand for its products and technologies. Demand is particularly strong now in the US market, helped in part by significant spending programmes at a number of major North American hubs – many of which are being supported by federal or state funding.

Rocha believes infrastructure development programmes at the likes of Los Angeles International (LAX), New York JFK and La Guardia have the potential to boost demand for the sorts of diesel but especially electric GSE offered by suppliers such as ITW GSE, whose own speciality lies in ramp power provision (in the form of ground power units, GPUs) and pre-conditioned air (PCA) systems.

The 3500 can play a role at the heart of the EcoGate concept

"Fossil fuel is coming to an end," Rocha suggested – maybe not soon, but the time will come. The evidence is clear in the North American aviation industry, he believes, and in the GSE that supports it. In particular, numerous US airport operators are investing heavily in greener equipment and processes.

And ITW GSE is supporting this

transition, its all-electric 7400 eGPU proving ever more popular, for example.

Many US air gateways are looking to offer power and air directly through their bridge infrastructure as they seek to facilitate rapid turnarounds and maximise efficiency while minimising carbon emissions, and ITW GSE supports all this. Indeed, perhaps the main focus of the ITW GSE stand at the International GSE Expo in Las Vegas was the optimisation of power-using efficiency by means of the company's EcoGate 'advanced gate economics'.

EcoGate is a system of GSE units linked together to use the gate bridge's power supply as sparingly as possible. The brain of EcoGate is the Intelligent Power Management (IPM) solution embedded in ITW GSE's 3500 bridge-installed PCA system.

With a 3500 managing an interlinked, efficient network of ground support equipment, the grid power supplied to the bridge can be used by the various items of GSE without impacting the supply of electricity to an aircraft at the gate.

Intelligent power provision makes for lower costs of electrical supply and minimises harmful emissions. The EcoGate system, based on the 3500, can be installed on existing gates and assists the aviation industry in its move towards a greener and more efficient future.

As well as the 3500 PCA, other EcoGate-enabled ITW GSE equipment was displayed on the company's stand at the International GSE Expo, including GPU, its 3500 air coil and 2400 cable retriever.

EcoGate is already in operation at a number of US airports – with United at Chicago O'Hare, at Washington Dulles, LA and at Minneapolis-Saint Paul, for instance – and offers "huge potential" in markets beyond the US too, Rocha observed.

US growth

In news announced at the International GSE Expo in Las Vegas, Vestergaard has reorganised its US team as it manages the

Breaking new ground

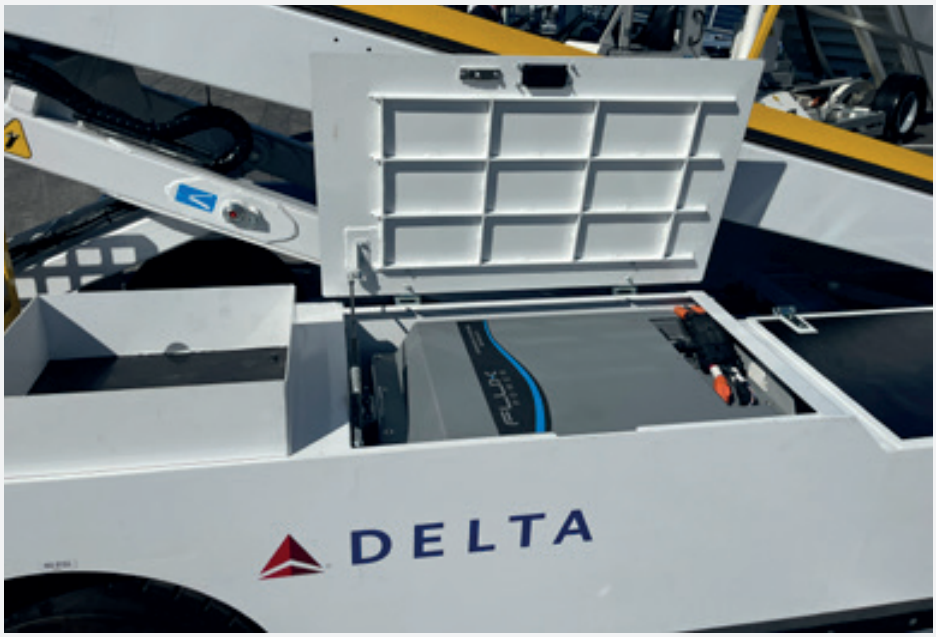
Vista, California, US-based Flux Power is a specialist in lithium-ion battery technology that started life serving the materials handling equipment (MHE) market back in 2009.

With its cautious approach to investment and development of a high-performing product, Flux Power has the very enviable record of "never having lost a customer", said CEO Ron Dutt.

Flux Power won its first big MHE customer in November 2017 when, working with Toyota Material Handling, it sold an initial batch of 200 Flux Power lithium-ion power packs to drinks giant Pepsi in the US. It was a mark of the desire of the MHE industry to move away from lead acid and into lithium-ion, Dutt believes, and the start of good things for Flux Power.

Other customers in this segment include the likes of Caterpillar and other forklift original equipment manufacturers (OEMs), as well as Flux Power's own direct customers.

About four years ago, Flux Power took the decision to move into a new market – aviation, and specifically GSE. Its packs are ideal for all sorts of GSE, Dutt considers, everything from baggage and cargo tractors to pushbacks (although some modifications were necessary to make the packs designed for MHE suitable for GSE, particularly in size and form but also to protect them from the harsh climatic conditions in which some of the units will be used).



Flux Power battery pack with Delta Air Lines GSE

The GSE market "represents a great diversification option", Dutt said. Delta Air Lines was the company's first big customer in this new market and the US carrier now has a four-figure number of GSE units powered by Flux Power packs.

Plus, Flux Power recently shipped a lot of its packs out to Air Canada, which is also taking the company's SkyBMSTM battery management system (BMS) telemetry solution.

Approximately 20-25% of Flux Power's business now lies in the GSE market, Dutt estimates. ■

"significant growth" it is experiencing in North America.

Brock Crocker has been promoted to the post of managing director of VCUS, while Peter Haug has been promoted to vice president of sales North America and new recruit Kalie Sadowski has been named customer service manager.

Also seeing substantial growth in North America is TCR. Managing director Americas, Jan De Leeuw, spoke to Airside at the International GSE Expo about how the Brussels-headquartered GSE leasing and rental specialist is rapidly increasing its presence on the continent.

TCR is now in over 50 airport locations in North America, across both the US and Canada. Today, 12 of those locations have a workshop/maintenance facility for servicing and repairing customers' GSE: Detroit (TCR's US refurbishment headquarters), Chicago O'Hare, Boston, Newark, Miami, Salt Lake City, Denver, Seattle and San Francisco in the US, as well as at Vancouver, Calgary and Kelowna in Canada. Coming soon are Washington Dulles, Toronto and New York JFK.

At all its other stations, TCR North America offers short-term rental and longer-term leasing packages, with repair and servicing options as required by each customer. De Leeuw and his team are considering additional locations for new workshops, some through organic expansion and some involving partnerships with existing businesses.

De Leeuw is hopeful that by the end of next year, there may be as many as 40 locations across North America hosting TCR engineering workshops. "It's all about finding the right people for these facilities," he said.

Detroit represents a good example of TCR North America's rapid growth in terms of servicing and repair capacity. Only a couple of years ago, it was home to just two TCR mechanics, but now it has four in the refurb shop, with two specialist technicians and an array of administrative staff supporting TCR's continent-wide refurbishment efforts.

The two workshops in Detroit, located just a couple of miles from Detroit Airport, have a footprint of some 30,000 square feet, plus a similar yard area.

Elsewhere, San Francisco Airport is home to six TCR employees, and the Newark operation has more than 20 people in its workshop.

"We have grown very strongly [in North America] over the last couple of years and we will continue to do so in the next couple of years," De Leeuw promised. "Business picked up very rapidly after the decline of Covid in 2021 and has kept growing strongly since," he continued, noting that the pandemic showed existing and potential customers the value of flexibility in GSE acquisition – and with its short-term rentals, long-term leases, and financing and buy-back options, TCR offers its clients exactly that.

Such flexibility is particularly important for handlers starting up new stations, or those who have just taken on new airline clients, and need equipment on site quickly. Given the supply chain bottlenecks affecting many GSE original equipment manufacturers (OEMs), the fact that TCR possesses a huge fleet of GSE available for use also represents a huge benefit to customers.

In fact, TCR has approximately 40,000 units of GSE in its current inventory, some 16,000-17,000 of them motorised.

Of those motorised vehicles, 40% are now battery-powered. TCR's flexibility is also manifest in its support of the aviation industry's transition to greener GSE: it can buy customers' diesel units and replace them with electric vehicles in customised programmes, for example. This option is much in demand, De Leeuw reported.

Electrification is progressing particularly fast in North America and especially in states like California, he pointed out, where state funding as well as federal programmes have boosted the transition to non-diesel GSE.

Airports like Los Angeles (LAX), New York JFK, Kansas City and Salt Lake City are just a few of those investing heavily in electrification and supporting the efforts of their handlers to do the same, De Leeuw said. However, the lack of charging points and related infrastructure remains the biggest obstacle to GSE operators going fully electric, he declared.

Next year, the International GSE Expo will move to Europe (following its European debut in Paris last year, the event will alternate between the US one year and Europe the next), before returning to Vegas again in 2025. The show is presented by the International Airport Equipment Manufacturers' Association (IEAMA) alongside Ground Support Worldwide and Airport Business. ■

TCR is supporting the aviation industry's adoption of greener GSE of all kinds

The entrance to the exhibition centre hosting inter airport Europe 2023

Review: inter airport Europe 2023

inter airport Europe returned this year in Munich, Germany for key manufacturers and suppliers to come together and showcase leading new products and technologies. ***William Hallowell*** reviews

With 437 exhibitors from 37 countries and more than 14,000 attendees, the event showed impressive innovations in terminal and ramp equipment and data systems.

The event's organisers said that the top five exhibitor countries were Germany, Italy, the UK, France and the Netherlands.

This year also saw the introduction of a new feature at inter airport Europe, the FOCUS Sustainability Summit, which aimed to bring key stakeholders together across 14 sessions, covering the industry's net zero carbon emissions commitments, sustainable terminal, apron and GSE operations, renewable energy and sustainable aviation fuel, and eVTOL technology.

In the opening ceremony, Nicola Hamann, managing director of the event's organiser RX, said: "inter airport Europe continues its near 50-year-long success story as a unique and longstanding partner of the international airport community.

"The show covers the supply chain of the global airport market, including the most comprehensive range of products and services for the entire airport – technology and services for ground handling, airport equipment, terminal operations, IT solutions and airport design.

She added that the show this year comprised "fantastic exhibits and live demonstrations by leading international brands and promising startups".

However, in conversation with *Airside*, a number of visitors and exhibitors raised concerns over the future of the event given that, in their view, it had been vastly scaled down in comparison to previous years.

One exhibitor remarked that it was half the size of the last show, as a result of GSE manufacturers vetoing the event over tensions with International GSE Expo.

Another described disappointment at what they saw as a shift in focus away from ground support equipment to the terminal side of airport operations.

In response, Hamann told *Airside*: "Our preliminary survey results show that two thirds of our international visitor audience is very interested in seeing GSE suppliers, and we've had a strong representation of GSE manufacturers at this year's event meeting this interest from our visitor audience.

中国东方航空设备集成有限公司
China Eastern Aviation Equipment Integration Co.,Ltd.
中国唯一造车的航空公司

China Eastern Aviation Equipment Integration Co.,Ltd.(CEAEI) focuses on the independent R&D of aviation ground equipment, continuously expands its array of products and services to build a cluster advantage in aviation ground equipment products.

Our product portfolio covers:

Aviation ground special equipment

Mainstream products for logistics station systems

Terminal baggage transfer equipment

Please follow us on WeChat official account

"At inter airport Europe 2023, GSE suppliers had the option to either exhibit in the outdoor area or in the halls, with companies such as Mulag, Rohr, Denge, Timsan, Esterer, TL Traffic Lines or Volkan doing so this year.

"These companies brought various equipment to the show, complementing the outdoor area with the GSE Experience Area."

However, Hamann did not comment on the impact that the manufacturers' veto had on attendance.

But exhibitors had plenty to showcase, from new innovations in tugs and tractors to the rising prominence of sustainable, electric GSE as the industry looks to accelerate its transition away from diesel-fuelled equipment.

Sustainability and the electrification of the GSE sector were topics that featured heavily across the event, as manufacturers consider how they can support the community's commitment to going green and reaching net zero by 2050.

In conversation with *Airside* in Munich, China Eastern Aviation Equipment Integration Co, a Chinese government-owned manufacturer, emphasised its commitment to the climate and sustainable development by showcasing its electric GSE innovations.

CEO Lu Ye Hui said the company wanted to use inter airport as an opportunity to expand into the continental markets with Chinese equipment.

"The trend of new energy for aviation ground support equipment for the future is becoming more and more clear – and the demand for electric products is increasing year by year," she explained.

"[We want to] adhere to the industrial development trends of green, low carbon and smart [GSE] ... [and] we are looking forward to becoming a green and low carbon cost [company]".

Further, Miles GSE told *Airside* that it is looking to release electric solutions next year for self-propelled equipment, whilst continuing to develop its Miles Smart System and working on autonomous products as well.

Engin Doğan, project supervisor at Miles, said: "With R&D [research and development] we are constantly looking to improve our products.

"Three years ago, we launched our Miles Start System. We are constantly upgrading it but it's a smart superstructure system with custom software patented by us.

"Basically, it consists of a touch screen and optional button controls, with a real-time demonstration of what the product is doing on a high-definition screen. This increases efficiency by 29% for the operators."

Meanwhile, Mototok had its new electric, remote-controlled tug on display, which you can read more about on page 36 of this issue.

***Nicola Hamann**, managing director of RX*

Judging from what exhibitors had to display this year, the big players have certainly laid something of a roadmap for the industry's move to a green alternative for the future. ■

MORE THAN 30 YEARS OF EXPERIENCE

Aviaco
GROUND SUPPORT EQUIPMENT

GSE REFURBISHMENT, MAINTENANCE & RENTAL

Industry leading expert in refurbished and used GSE! We are ready to assist you with all your second-hand ground support equipment needs.

- Sales and Purchase
- Repair & Maintenance
- Value-added Services
- GSE Rental Solutions
- Fleet Management
- GSE Electric conversion

Aviaco
SUSTAINABLE GSE

Save up to **40%**

- Electric GSE supports your company in **reaching your sustainability goals**, as well as your economic targets.
- Electric GSE saves money on maintenance and fuel:
  - **Maintenance reduction of 25%** due to an increase in reliability on the drivetrain and a decrease of operating hours on preventive maintenance.
  - **A minimum fuel saving of 40%.**

AVIACO BECOMES GREEN!

NEW SERVICE: CONVERSION ELECTRIC GSE

sales@aviaco-gse.com | operations@aviaco-gse.com | **www.aviaco-gse.com**

TEMPEST*i*

JBT AeroTech

An Oshkosh Corporation Company

Being prepared is the key to ensuring your operation runs smoothly and having the right equipment for the job is just as critical. With the Tempest-i Deicers in your fleet you'll be in control even in the fiercest winter storm! Discover all the benefits that make a Tempest-i Deicer an invaluable piece of your winter operations.

oshkoshaerotech.com

The calm in the storm.

GREAT RELIABILITY
EASY TO OPERATE
EASY TO MAINTAIN