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By Joe Petrie

Etihad Airways brings its A350-1000 into service to tackle carbon emissions.

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See a demonstration of the ACAS System fitted on TREPEL cargo loaders.

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Next-Generation Aviation Technology Takes FLITE in Grand Rapids

Leaders from Gerald R. Ford International Airport, Southwest Airlines and Michigan Economic Development Corp. discuss the new FLITE Program and plans to nurture new technology in the aviation sector.

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ASD Retrofit Kit

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Snow, Software and Streamlined Operations

By Walker Jaroch

From snowfall to software, airfield operations can be streamlined in a number of ways.

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Legal Issues and Digital Twins

By Margaret Martin

Multiple legal issues need to be considered when collecting and using data.

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Comparing Two Pressure-Step Method Tightness Monitoring Solutions: Fixed vs. Portable

By Dean Golba

Technologies for jet fuel leak detection are divided into two strategies - internal methods that monitor fluid properties and external methods that monitor for fluid release.

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BSCA's Move to Electric Equipment

By Josh Smith

To help meet environmental goals, officials at Brussels South Charleroi Airport have implemented eGSE, including Aviogei's VASM 1500E potable water unit.

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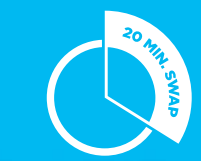

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Editor's Note

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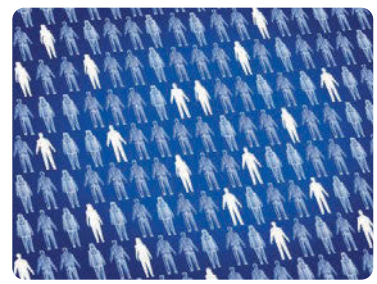
How Should We Address the Labor Shortage?

Staffing skilled employees is a significant challenge facing aviation and the ground handling sector, but efforts are being taken to attract new personnel to the industry.

Welcome to our annual Leaders of the Year issue. We hope you enjoy learning more about this year's winners.

When we visited with Team Leader of the Year Kenny Gibson, he shared a few examples of how he is working to welcome young people to Banyan Air Service and introduce them to career paths within the aviation industry.

Staffing skilled employees is a significant challenge facing the ground handling industry – and aviation as a whole. The ground handling labor shortage was a critical topic throughout the panel discussions during the 6th GHI Americas Conference.



As some ground handling personnel are leaving the industry to take jobs that may pay better or are less demanding, David Barker, divisional senior vice president of airport operations at dnata, said it is important to re-evaluate how we look at careers in the ground handling sector. He encouraged attendees to consider this work as a profession – not a job – and invest in the career path of employees.

He noted ground handling entities are harming one another by undercutting each other in shared markets.

"It's ok to compete, but we should not be competing for minimum wage," Barker said. "It's not about competition. It's about being aviation professionals."

Glyn Hughes, director general of The International Air Cargo Association (TIACA), said the need to attract the next generation of the workforce is paramount to the industry's success. He added the industry needs to do a better job of appealing to women, who make up 50 percent of the world's population but are not represented to the same degree in ground handling.

Robert Fordree, executive vice president of cargo at Menzies Aviation, encouraged the industry to accelerate the use of technology as a way to attract the next generation of the workforce.

"We do have future growth potential – enormous growth potential," he said. "We can make it an attractive business."

On the topic of new technology, innovation in ground support equipment (GSE) is also critical for the ground handling industry.

Michael Bloomfield, chairman of the International Airport Equipment Manufacturers' Association (IAEMA), highlighted key trends in the GSE space. Among these trends, autonomous technology is being incorporated into ground support equipment to help with menial tasks around the ramp and help overcome labor shortages.

Elsewhere on the labor front, the U.S. House of Representatives' House Transportation and Infrastructure (T&I) Committee reviewed and approved a bill that aims to establish a National Center for the Advancement of Aviation, which would bring together stakeholders from across the military and private sectors of aviation to provide STEM-focused resources to high school and collegiate curriculum developers, among other goals.

The bill, H.R. 3482, was introduced in May 2021. Companion legislation in the U.S. Senate was introduced in Feb. 2020. The bill now moves to the House floor for deliberation.

"NBAA is totally committed to promoting the development of our industry's future workforce and we look forward to doing all we can to ensure passage of this legislation," NBAA President Ed Bolen said.

Is the solution to aviation's labor shortage better employee recruitment and retention or turning to technology and automation to lighten the workload? The answer is likely a bit of both.

How is your business approaching the ground handling labor shortage?

Please reach out to me at josh@AviationPros.com with specific examples. I welcome your feedback on the topic.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TOP NEWS

Bournemouth Airport Launches Dedicated Cargo Handling Service

With the official launch of Cargo First, a dedicated cargo handling service, Bournemouth Airport is cementing itself as one of the fastest developing cargo airports in the UK and the one of the country's newest trade links. The airport is privately owned as part of Regional & City Airports (RCA).

From a standing start with almost no cargo in April 2020, Bournemouth Airport saw 20,000 tonnes of throughput by the end of March 2022, making it the fastest growing UK cargo hub based on 2020 statistics, and on the verge of breaking into the UK's top 10 busiest cargo airports. The airport is playing a central role in enabling commercial exports from the UK to the U.S. with European Cargo Limited, which now operates a fleet of wide-body cargo aircraft.

"The launch of Cargo First consolidates the critical work of the team at Bournemouth Airport during the past two years. We quickly recognized the opportunity to stand up a new trade lane and facilitate exports from the UK to the USA, as well as supporting the temporary demand for PPE and test kits," Andrew Bell, CEO, Regional & City Airports, said.

"Cargo First is well connected to London by road, and we can have consignments in the market faster than through hub airports. Additionally, our unique One Team approach means our customers don't have to deal with multiple vendors, giving them greater simplicity, efficiency and speed to market."

Upcoming Events

May 23-25
CNS Partnership Conference
Phoenix, AZ

May 23-25
European Business Aviation Convention & Exhibition (EBACE2022)
Geneva, Switzerland

May 31-June 2
IATA Ground Handling Conference
Paris, France

June 5-8
AAAE Conference & Exposition
Seattle, Washington

June 15-16
2022 NATA Aviation Leadership Conference (ALC)
Washington, D.C.

TEXTRON GSE
GROUND SUPPORT EQUIPMENT
Pushing Forward

Textron GSE To Electrify Product Line with GM and PCS

Textron Ground Support Equipment (GSE) Inc. will collaborate with General Motors (GM) and Powertrain Control Solutions (PCS) to electrify its product line.

Together, GM and PCS have developed an integrated driveline, specifically designed for Textron GSE products, that utilizes GM's lithium-ion battery systems. The driveline will allow Textron GSE to leverage GM's experience in electric propulsion solutions. The program also continues a long-standing relationship between GM and PCS, which have worked together since 2013 to integrate GM technologies into products that meet the requirements of the GSE industry.

"This technology, designed especially for ground support operations, will enable Textron GSE to broaden its electric product offerings across our TUG, Premier, Douglas and Safeaero brands, and elevate electrification across our entire industry," said Matt Chaffin, vice president and general manager, GSE, for Textron Specialized Vehicles Inc. "We are committed to advancing the GSE industry by developing sustainable technologies and leveraging leading technology to electrify the next generation of ground support equipment."

NAS Renews ISAGO Accreditation for Kilimanjaro and Dar Es Salam in Tanzania

National Aviation Services (NAS) has renewed its IATA Safety Audit for Ground Operations (ISAGO) accreditation for Kilimanjaro and Dar Es Salaam in Tanzania. NAS Dar Airco's operations at the Kilimanjaro International Airport and the Julius Nyerere International Airport are ISAGO-accredited covering

organization and management (ORM), load control (LOD), passenger and baggage handling (PAB), aircraft handling and loading (HDL), aircraft ground movement (AGM) as well as cargo and mail handling (CGM).

NAS Dar Airco handles over 3,000 flights operating in and out of the two airports annually, including Astral Aviation, Ethiopian Airlines, Fly Dubai, KLM and RwandAir.

The ISAGO is an internationally recognized audit program for assessing safety management and control systems for ground handling service providers. Based on industry-proven quality audit principles, ISAGO follows a stringent and structured process that reviews training, management system policies, processes and procedures, etc.

TITAN Aviation Fuels Acquires European-Based Aviation Fuel Reseller AKRYL

TITAN Aviation Fuels announces the acquisition of AKRYL.

AKRYL is an aviation fuel reseller with an online digital fuel procurement platform that allows flight departments to view fuel pricing in real time and make fuel purchases worldwide. This program can be integrated with a customer's operations software to enable a streamlined and efficient way to manage fueling operations.

"We are very excited about the AKRYL acquisition," said TITAN Aviation Fuels president Robbie Stallings. "Not only does this integration give our Contract Fuel Program an international footprint for our North American-based customers, but also provides access to TITAN programs for European-based customers traveling to North America, and as a result, drives international traffic to our extensive TITAN-branded FBO network."

PEOPLE

Alliance Ground International Appoints Chief Commercial Officer

Larreur

Alliance Ground International (AGI) has appointed Roger Larreur as its chief commercial officer (CCO) as part of its ongoing strategy to drive growth, sustainability and resilience.

"Roger has unparalleled credentials and is the perfect fit to drive our cargo handling, ground handling, mail handling, security services and expansion into passenger services," said Jared Azcuy, chief executive officer, AGI.

With over 30 years of experience in the sector, Larreur has managed accounts for some of the world's largest airlines and airports for both cargo and passenger-related services, and he has worked across the Americas, Europe and Asia. Prior to AGI, Larreur served as CCO, Americas for Swissport.

"AGI has made clear its intent to invest in its infrastructure and technology, and I look forward to being part of the team that will take this organization to the next level," said Larreur. "There is enormous potential for growth in the sector, especially in North America, and I look forward to employing my experience to help ensure that AGI's commitment to strategic investment, exceptional customer service, and innovation continues to be well-placed and duly-rewarded."

WFS Appoints Lynch SVP, Commercial – Americas

Worldwide Flight Services (WFS) has appointed Tom Lynch as senior vice president, commercial for the Americas.

Lynch

In this role, based in Dallas/Fort Worth and reporting to Mike Simpson, WFS executive vice president for the Americas, Lynch will build out WFS sales capabilities through collaborative training and mentoring, work with the operations group to ensure implementation and ongoing operations with customers. He will also work closely with the WFS international commercial team to ensure alignment with the group's strategy and objectives.

"Tom is recognized for his communication skills and ability to build strong relationships at all levels of the organization, from the C-Suite to the front line. I am confident he will be an engaging leader who places an emphasis on building, coaching, and developing high caliber, diverse teams. He will play a key role in our continued growth in the Americas and use his broad experience of other industries to inject innovative, fresh ideas to build our existing and new customer relationships," said Simpson.

NEW DEALS

dnata to Expand Cargo Operations into Germany

dnata announced an expansion of its European footprint through the planned acquisition of Germany-based Wisskirchen Handling Services.

Wisskirchen is the exclusive operator of the Cologne Bonn Cargo Centre, a 12,000-square-meter facility at Cologne/Bonn Airport (CGN) providing a full range of cargo services via a team of about 180 highly trained employees. Wisskirchen handles more than 85,000 tonnes of cargo annually.

"We are delighted to announce dnata's first cargo investment in Germany. This is part of our continued broader investment in cargo infrastructure. Since 2014, we have invested in nine new cargo facilities in Europe. We look forward to playing our role in the next stage of development of Cologne/Bonn Airport as a major cargo hub, and I would like to thank Oliver Hellwig for his professionalism during this process," Stewart Angus, dnata's regional CEO for Europe, said.

Aerolineas Argentinas Chooses Orbital for Handling Contracts in Brazil

Orbital Group has won handling contracts from Aerolineas Argentinas in São Paulo, Rio de Janiero and Brasilia.

Majority owned by Worldwide Flight Services (WFS), Orbital has been awarded two-year contracts by the airline with the responsibility of handling about 1,800 flights per annum and serving over

210,000 passengers annually. This will include check-in, lost and found, boarding and flight arrivals as well as security services.

Rubens Pereira Leitão Filho, CEO at Orbital, said, "These three new contracts emphasize our growing strategic partnership with Aerolineas Argentinas, which has been an important customer of Orbital for many years. We can support their requirements due to our strong presence at these major airport gateways in Brazil and the respected ground handling skills of our local teams. We hope this will also lead to more opportunities to serve Aerolineas Argentinas and its customers at more airports across WFS' global network."

IGHC to Focus on Overcoming Labor Shortages and Improved Ground Handling Efficiency

When the global airport ground handling community meets in person in Paris at the 34th IATA Ground Handling Conference (IGHC), May 31-June 2, key among the topics to be discussed will be accommodating the surging demand for air travel with shrunken staff levels.

Successful ground operations are vital to sustaining the industry's recovery. Unfortunately, after the greatest downturn in history, aviation is facing severe labor shortages and challenges in recruiting and retaining staff. Restoring thousands of ground services jobs without the benefit of the "institutional memory" of those who have permanently left the industry is a massive challenge.

The scaling up of operations to meet demand will be facilitated and sustained by increased compliance with global standards. A standardized and globally accepted framework for safe and efficient ground operations is crucial. Fortunately, such a document exists: the IATA Ground Operations Manual (IGOM).

For more than 10 years, the IGOM has been the standard reference for airlines and ground service providers (GSPs), it's regularly updated guidance proving invaluable in a highly fragmented business sector. There are hundreds of users worldwide and the adoption rate is good; but the ground handling community needs to accelerate the global adoption of IGOM to ensure worldwide operational consistency and safety. To support this, IATA has launched the IGOM portal, an online platform where airlines and ground handlers can share the results of their gap analysis between company procedures and IGOM.

Overlaying the IGOM is the IATA Safety Audit for Ground Operations (ISAGO), which is an industry global standard for the oversight and audit of GSPs. It encompasses and provides an independent assessment of all aspects of managing and providing safe ground handling services. IATA is urging governments to recognize ISAGO in their regulatory frameworks for oversight. This will deliver significant benefits, including greater harmonization, Safety Management System (SMS) implementation by the ground handlers and reduction of wasteful duplicative audits that providers must often undergo.

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Key Considerations for Effective Ramp Communication

How wireless headset systems improve ramp communications for enhanced safety and incident avoidance.

BY BOB DAIGLE

To the casual observer, the airside environment at busy airports can seem like a chaotic choreography of aircraft, ground support equipment (GSE) and a variety of support vehicles.

For ground support personnel, the ramp is a dangerous place, e.g., that catering truck in the wrong place at the wrong time. Once the command from the flight deck of "brakes released" is given, it is the ground crew that becomes temporarily responsible for the safe maneuvering of aircraft, ensuring that no part of the aircraft structure will impact other aircraft, support vehicle or fixed object.

This is no easy task based on data from the *International Air Transport Association* (IATA) as reported by the *Flight Safety Foundation* (FSF) website:

"The Foundation estimates that 27,000 ramp accidents and incidents – one per 1,000 departures – occur worldwide every year. About 243,000 people are injured each year in these accidents and incidents; the injury rate is nine per 1,000 departures.

"Ramp accidents cost major airlines worldwide at least $10 billion a year. These accidents affect airport operations, result in personnel injuries and damage aircraft, facilities and ground support equipment."

Given these sobering statistics, forward-thinking airlines are constantly looking for new technology to make the ramp environment a safer place, and ground personnel more productive.

Headset Communication Systems on the Ramp

Communication headsets are common in the ramp environment. Wired headset systems are primarily used during aircraft pushback and deicing/anti-icing operations. Traditionally during pushback, the tug operator communicates with the flight deck via a headset and cable connected to the aircraft interphone, or in the case of deicing operations, from the deicing vehicle intercom to the bucket. While wired headsets provide clear communication and hearing protection from the roar of jet engines and other sources of ambient noise on the apron, they have limitations:

- Wired headsets require users to be tethered to the aircraft, limiting the mobility of ground support personnel to move freely around the aircraft.
- Wired headset systems are not designed for multiple users, e.g., wing-walkers, critical to the safe movement of the aircraft, are left out of the communication loop.
- The wires and cables required for wired headset systems can get entangled with other equipment and are subject to damage, wear and the cost of frequent replacement.

Finally, there is the ever-present danger of lightning strikes. Should the aircraft be struck by lightning, the wire or cable connecting the aircraft to the push tug and driver becomes a ready conduit for injury and electrocution. The abstract: *Lightning Threats and Enhancements of Safety for Airside Operations* (published in May 2017), cites that, "Usage of headsets with connecting wire between the aircraft and the headset worn by the user account for 51.9 percent of lightning-related injuries."

The Advent of Wireless Systems

The introduction of wireless headset systems to the airline industry around 2010 has dramatically improved ground operations, enabling effective communication between the person in charge of the flight deck and the marshalling agent or person in charge of the ground crew, as well as between ground crew members. Because many wireless systems have a range of up to 300 feet (approx. 100 meters), wing-walkers are transformed into "wing-*talkers*" – no longer having to rely exclusively on hand signals and visual cues to communicate with the tug driver. This is particularly important for any pushback requiring multiple turns and pushing in a tight area, close to airport buildings, GSE and other aircraft.

Most wireless headset systems accommodate multiple users (up to four with some systems) per wireless gateway or base station. Rather than a single user communicating only with the flight deck, as with a wired headset system, there are more eyes and ears working on a pushback deployment, significantly reducing the potential of an accident and subsequent personal injury or damage to aircraft and other ramp equipment.

Additional benefits of wireless systems on the ramp include:

- Hands-free, full-duplex communication – critical for tug and deicing truck drivers/bucket operators to perform

A wing-walker uses a wireless headset to verbally communicate with the tug operator during pushback operation.

their tasks productively and efficiently.

- Improved situational awareness – all crew members are on the same page and aware of any potential dangers during ground support operations.
- Enhanced deicing operations – keeps bucket personnel in constant contact with the deicing driver without delays and stoppages to expedite deicing operations, less waste of valuable deicing fluids.
- Expands ground support applications – beyond pushback and deicing, can be used to facilitate aircraft loading, towing, maintenance and general ramp operations.
- Hearing protection – protects the hearing of ground crew personnel against the roar of jet engines and the din of apron activity and other equipment.
- Contributes to on-time performance – time between flights (beating the gate clock) is of paramount importance to airlines. Every minute saved helps avoid delays, contributes to improved turnaround, bottom-line profitability and keeps customers happy.

Wireless System Similarities and Differences

Many wireless systems on the market today share similar characteristics. However there are significant differences worth mentioning. Most wireless headset systems for the airline industry utilize a Digital Enhanced Cordless Telecommunications (DECT) wireless protocol as opposed to Bluetooth wireless. DECT was developed explicitly for wireless audio. Bluetooth frequencies are in the ISM band where industrial and consumer products operate. DECT, however, operates at frequencies reserved exclusively for voice communication using the DECT protocol.

Wireless Versus Cordless

Another important distinction between wireless headset systems is their configuration. There are marked differences between "wireless" systems and "cordless" systems. Many cordless wireless communication systems feature headsets that contain all electronics within the ear cups of the headset. Although this type of system provides "cordless" freedom and mobility, the self-contained design means that the headsets may be inherently heavier and bulkier.

As with any wireless headset, charging is also an important consideration. Should a self-contained headset require charging, the headset must be taken out of service and replaced by a fully charged headset. Rather than having to purchase additional headsets as backups, many airlines lean toward a wireless system that features a belt station containing the wireless "radio" and is powered by a li-polymer battery that provides 24 hours of continuous use. Should power run low, the user can simply replace the battery in the belt station and continue working while the headset remains in service.

Wireless Headsets that "Talk"

Some wireless headset systems also offer a variety of smart feature sets in the form of audio/voice prompts to assist ground personnel. These include link/purge status, out of range and low battery parameters. Many wireless systems simply shutdown automatically when users are out of range or if the signal is lost. To provide added safety, some systems provide audio prompts (such as series of "beeps") when the user is approaching the extent of the system's wireless range. This is followed by a voice prompt that automatically notifies ground crew members if communication connectivity has been lost, allowing them to return within range if possible or react accordingly if not. An additional voice prompt will then indicate when users are within the system's wireless range and connectivity has been restored.

System Durability for the Ramp Environment

Lastly, it is critical to be sure that wireless system components are purpose-built to stand up to the rigors of the ramp environment. Not all wireless headsets and system components are created equal. Look for those that offer marine-grade, watertight, impact-resistant enclosures, and a wide temperature operating range. It is also important to remember that wireless headsets are normally shared by ground crew personnel, so hygiene is an important factor. Headsets and components should be easy to clean and maintain. Headset head pads and ear seals should be made using non-porous materials, polyurethane material for easy and effective cleaning and disinfection.

Effective communication between the flight deck and ground crew, and between ground crew members, is critical. There is a growing consensus among airlines that clear voice communication is a welcome enhancement to traditional hand signals and safety protocols. Wireless headset systems improve overall safety, situational awareness and hearing protection for ground crew members - contributing to accident avoidance and on-time airline performance. **GSW**

ABOUT THE AUTHOR

BOB DAIGLE

Bob Daigle, systems manager at David Clark Company, has more than 15 years of experience working with hundreds of airlines – from small regionals to major carriers worldwide – in the design, configuration and implementation of both wired and wireless headset systems for airside communication applications.

Stinar LLC

2022 Product Leader of the Year

The company's modular chassis and wagon offer versatility to ground service providers looking to utilize smaller equipment.

BY JOSH SMITH

Ground service providers at FBOs and smaller, regional airports have the same GSE needs as larger operations, just not to the same scale.

Stinar LLC supports this segment of the ground handling industry with right-sized equipment.

"They don't need a 350-gallon lavatory truck to service two GVs. So, one of our little 150-gallon lav and potable water carts is a good size for them, and it works," explains Stinar CEO/CVO Craig Kruckeberg.

However, he noticed this smaller equipment was often being towed by larger tractors. So, Stinar's team of engineers set out to find a solution. The result was the company's line of modular units.

Customers can place a potable water unit, lavatory service unit, maintenance box and more on top of either a modular chassis or modular wagon to suit their individual needs.

"The modular unit provides flexibility to service providers in offering an interchangeable service vehicle capable of handling all kinds of different tasks that ground service providers encounter day in and day out," says Jason Johnson, vice president of business development at Stinar.

Stinar began developing the modular units in the spring of 2021 and had prototypes completed and ready to display later that year at the International GSE Expo and NBAA-BACE.

For developing its flexible solution and presenting it to FBO, regional airport and MRO markets in less than a year, Stinar LLC has been named the *Ground Support Worldwide* 2022 Product Leader of the Year.

A Solution for FBOs

Stinar has a reputation for building large GSE units, like passenger stairs, maintenance lifts, vehicles for passengers with reduced mobility (PRM) and more, Kruckeberg explains.

But when he acquired the company in 2019, Kruckeberg entered the GSE market with fresh view.

"Everyone wants to build the big stuff. I'm seeing less and less people building, what I would call, the basics," he says.

Inspiration struck when Kruckeberg was traveling through Florida. While stepping off an aircraft, he saw one of Stinar's lavatory carts being pulled by a lawn tractor with the mower deck taken off. If that ground handling staff didn't utilize a large tractor to tow the cart, he figured other FBOs may be looking for a similar solution.

Identifying FBOs as an under-tapped market, Stinar partnered with Polaris and Taylor-Dunn Manufacturing to develop a vehicle that its carts could mount on.

Stinar began developing its modular units in the spring of 2021 and had prototypes completed later that year.

"We redesigned our lavatory carts and our potable water carts to fit on these units, (and) married them together," Kruckeberg says. "If you take the wheels off our carts, it actually drops on the back of these chassis.

"It's made things a lot faster and smoother for us," he adds. "We already have the carts – we've had the lav carts and the potable water carts and everything. We just needed a power unit to put under it."

The power unit is also capable of pulling equipment, such as Stinar's wagon. The modular wagon unit can accept the same carts and accessories the chassis can.

"With our system, you don't need a tug. You've got the power unit, and you could put a maintenance modular system on the power unit. Then if you want to pull the potable water unit at the same time, you can," Kruckeberg says. "Or, if you don't want to pull anything – there's a lot of people that don't want you pulling anything around their aircraft – you just swap it out and drive right up to it with a small, electric unit."

To develop its modular units further, Stinar is working to build its own modular chassis in-house. The company, which had been located in Eagan, Minn., has relocated to Blooming Prairie, Minn., where its 22 employees are operating out of a 65,000-square-foot facility built and designed for manufacturing.

"We have the ability, with our new facility, to start building our own chassis," says Kruckeberg, noting the company plans to add another 55,000 square feet in the spring of 2023.

From left, Jason Johnson, VP of business development; Brandon Haubenschild, production manager; Amy Hinzmann, CFO/COO; and Craig Kruckeberg, CEO/CVO, accepted Stinar's Product Leader of the Year recognition.

Key Features

Stinar has developed modular potable water, passenger transport, maintenance, lavatory service, refuse and flush and fill units to fit their chassis and wagon.

This allows most ground service at FBOs and regional airports to be performed, Johnson explains, adding the versatility of an interchangeable system provides value to customers.

"I think of it like a cell phone charger. When you buy a cell phone, you've got your plug that you plug into the wall, and then you get all the different adapters because every new phone out there is making proprietary plug-ins. It's nice just to have the one plug-in with the multi-tipped end," Johnson says.

"We've really got the plug-in, which is our unit – our chassis or our wagon, and we've got the multi-tips with our baggage carriers, our lavatory and water carts, our stairs, our lifts," Johnson says. "It's exciting to see what this is going to bring to us."

Kruckeberg adds the possibilities for Stinar's modular units are nearly endless and the company's engineers continue to develop additional modular options.

"We'll be able to put a 16-foot scissor lift on our chassis because of the profile and the size," Kruckeberg notes as an example.

He adds that whatever need a ground handler may have at an FBO or smaller airport, Stinar will be able to address most of those needs with the modular unit.

"We're just shrinking it down. We're just miniaturizing it," Kruckeberg says.

While the original chassis for the modular unit offered an electric drivetrain, developing its own chassis will allow Stinar additional flexibility. For example, where cold weather isn't as conducive to electric equipment or where charging infrastructure is unavailable, Stinar will provide a diesel- or gasoline-powered chassis for those customers.

The modular units also include a number of safety features.

Nuts are welded to the unit to avoid creating foreign object debris (FOD) on the ramp. Proximity sensors and switches are included to prevent GSE collisions with aircraft. Back-up cameras and interlocks on stabilizers and cylinders provide additional safety.

"We have that technology now in all of our truck chassis," Kruckeberg says. "All that technology is there. It's all available, we just miniaturized it all down into these little chassis."

What's more, the modular units are well lit for overnight tasks and the chassis is built to assist drivers.

"It's easier for them to see around themselves," Johnson says. "And the turning radius you get, in of itself, on the smaller, miniaturized chassis, it's just easier to operate. It's more comfortable. You're not in a bigger unit with blind spots."

Pointing to the quality of materials used to build the equipment, Kruckeberg says the life expectancy of the modular units can likely be measured in decades. For example, smart-chargers extend the life of batteries, stainless steel provides more durability for the tanks and powder coat paint offers a higher quality finish.

"The longevity of Stinar equipment, we carry that into the modular also," Kruckeberg says, noting Stinar has always built reliable equipment by over-engineering.

"We've just basically taken ground support equipment and miniaturized it to allow the other airports – the FBOs and regionals – to have the same attributes that the big airports have," he adds.

"It really started with an idea from travel. That's where we saw a lot of it, from our own travel experiences. And then talking with different customers about what we could help with," Johnson says. "We started the innovation in a round-about, weird way. We used a prototype, and now the ultimate goal is to make a Stinar self-propelled alternative-fueled vehicle. Or a traditional fuel, with a gas or diesel engine.

"We're proud of this whole thing that we developed in a record time when we had a new team." **GSW**

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For more information regarding the Product Leader of the Year, visit:

AviationPros.com/21254763

Stinar's modular chassis is capable of towing the company's modular wagon which can increase efficiency.

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Kenny Gibson

2022 Team Leader of the Year

With a focus on policy and documentation, Gibson has enhanced Banyan Air Service's safety practices and has led the FBO to Stage 2 IS-BAH Registration.

BY JOSH SMITH

When Kenny Gibson sets out to do something, he sees to it that the task is completed and done to the best of his ability. He's applied that attitude to the safety initiatives being undertaken at Banyan Air Service.

Kenny Gibson (center) works closely with line service technicians, including Alex Casanova (left), and on-the-job trainers like Peter Perez. (right).

He has risen into a leadership position quickly. Since beginning with Banyan at Fort Lauderdale Executive Airport (FXE) in 2007, Gibson has been promoted to third shift supervisor, second shift supervisor and training manager.

Now serving as training and safety manager – a role which he has held since 2016 – and vice chairman of Banyan's Safety Committee, Gibson manages five on-the-job trainers and works alongside the line service manager to help lead a team of 42 employees in the line service department

What's more, Gibson has been instrumental in implementing a new training manual with a complete emergency response plan (ERP) and a safety management system (SMS). Most recently, he guided Banyan Air Service through the International Standard for Business Aircraft Handling (IS-BAH) process, and documented safety procedures to secure Stage 2 registration in the IS-BAH program.

For his dedication to improving operations and ensuring the safety of his colleagues, Gibson has been named *Ground Support Worldwide's* 2022 Team Leader of the Year.

Improving Safety

Gibson's aviation career began in 1999 when he took a job as a line service

technician for Miami Aviation Corporation. During a change with Miami Aviation Corporation ownership, Gibson took the opportunity to work for the new management at Landmark Aviation, which transferred him to F45 North Palm Beach County General Aviation Airport.

"After five years in Miami, I moved to work for Sheltair at FLL as their traveling supervisor, where I was in charge of the teams at all Florida locations. I gained profound experience in line service and can tow aircraft ranging from a Cessna 152 to a Boeing 747," Gibson says.

He joined Banyan Air Service in 2007 and continued to grow his career through a multitude of training courses. Gibson completed the NATA Safety 1st Line Service Training and Supervisor Training courses; the Avfuel Professional Fuel Handling Training Course; and the American Safety Council Class A/B Operator Storage Tank Training Course.

"I completed the Foster Learning Leadership course and it focused on how to engage in difficult conversation topics, best managerial leadership practices, how to properly delegate and really hone in on my decision-making, team building and planning skills," Gibson says.

He earned the Aviation Maintenance Never Events Certification and received the Fort Lauderdale Executive Airport Recognition Award. Gibson also completed the OSHA 10-Hour General Industry Outreach Training Program and AEA Safety Management Systems Employee Initial Training.

Gibson says he strives to keep his management style straightforward and to the point, which helps him manage a variety of personalities and adapt to each person as needed. He maintains an open-door policy. But while approachable, he prefers not to "sugarcoat" his communications because safety is the top priority for his team and customers.

"With frequent and ongoing changes in policies and procedures at Banyan and on a national level, it is challenging to keep the whole team updated," Gibson says.

Drafting a new training manual with a complete ERP helped him develop communications skills, he says.

Because Gibson manages five on-the-job trainers, he has to ensure that communication is flowing through those team members to other personnel in the line service department.

"I try to meet with them, usually, on a daily basis. We go over what they train, and then we can go back and forth on new industry practices that we have," Gibson says.

"Usually at 2 p.m., we have a line service huddle. We talk about the hot topics we have for today," he continues. "Every other week, I have a one-on-one with that trainer. Then every month I have an on-the-job trainers sessions with those five individuals."

Gibson relies on his trainers to help onboarding new hires but is also closely involved in bringing a new person on staff.

"When we receive a new hire, they will spend one week with me going through training modules, a tour of the entire company, a ride-along to familiarize themselves with proper procedure and then they are sent to the trainer to learn about frontline protocol – avgas and jet fueling, towing and safety precautions," Gibson explains. "After the new hire completes the entire training process, they are sent back to me to sign off on each action item they were trained on."

To further ensure his entire team conducts operations safely, Gibson hosts annual towing classes and aircraft marshalling sessions to refresh his teammates' proficiency and knowledge.

In addition to his safety-related work, Gibson works alongside line service manager Ryan Bartman, to oversee the department.

"On a daily basis, me and Ryan are in charge of all our admin stuff," Gibson says. "We work side-by-side when it comes to that."

Creating Policy

A routine day begins with analyzing the SMS. Gibson checks for any pending requests and reviews everything that was inputted. He checks in with all departments and addresses duties related to disaster preparedness, training courses and inventory needs, among others.

From left, Jon Tonko, VP of FBO services, Kenny Gibson and Don Campion, CEO at Banyan Air Service.

While his daily duties expand beyond safety, Gibson's dedication to safe working practices has had a profound impact on Banyan Air Service.

"Kenny is one of the most knowledgeable people in the aviation industry. He's our go-to guy for all questions about safety," says Bartman.

"I believe a business can only run efficiently when all procedures are following the proper safety protocols," Gibson adds. "I make sure all policies, procedures and training manuals are up to date, have bi-weekly meetings with my trainers and monthly meetings with the entire team."

Banyan leadership recognized the IS-BAH program was becoming an industry standard and made the decision to pursue Stage 1 registration in 2018.

Banyan wanted to maintain its reputation of being a leader in business aviation and began the process of completing Stage 1 in 2018, spearheaded by Gibson. To achieve this goal, Gibson recognized that the FBO would need a new training manual to ensure policy and procedures were properly implemented. To ensure compliance

with IS-BAH standards, he opted to write the new training manual from scratch. He based the manual off the FBO's policy and procedures and documented standard operating procedures (SOPs)

"I started writing it all down. When I was done, I had 400 pages of stuff that I wrote, and it was all in the mix of everything," Gibson says. "Then I had to take all those 400 pages and kind of combine what section it needed to go to.

"It took over a year to write that. It was very extensive. Even our IS-BAH auditor said it was very extensive," Gibson says. "But I'm the type of person that if I start something, I need to finish it. And I need to finish it to the best of my abilities.

"Now, it's an actual manual."

The new training manual, which included an overhauled emergency response plan for the FBO, was a great way to start IS-BAH preparations.

"The biggest challenge I had was actually training the new manual," he says. "Everybody that knew our old manual and looked at and saw it, now had to go through initial training. We had a class where we went through every single portion of that manual. It took about three hours each class, so we had to break it into two classes.

"Implementing an SMS system and creating a new training manual has truly helped Banyan become more efficient and work at a higher level of maintaining safety protocol."

Banyan began seeking Stage 2 IS-BAH certification in 2020 after its ground ops team was comfortable with the new SMS system.

"Everything we've implemented since Stage 1 had to be specifically documented in great detail," Gibson says. "I was focused and dedicated on making sure nothing was lost in the process."

The documentation habits developed during the IS-BAH process have also translated to comprehensive documentation for additional topics.

To avoid diesel exhaust fluid (DEF) contamination of fuel, Gibson outlined a comprehensive safety procedure.

"The State of Florida requires all FBOs to have a DEF plan in place. That was right as we were doing Stage 2, so I had to create that as we were doing Stage 2," Gibson says. "I had our IS-BAH auditor take a copy of that as a baseline for all the FBOs for the State of Florida."

Banyan's IS-BAH auditor also took a copy of Gibson's extensive catering audit checklist to use as an example.

This past year, Gibson added the role

of vice chairman of Banyan's Safety Committee, which was critical during the pandemic.

"Kenny performed an excellent job in keeping teammates and customers safe while following all CDC guidelines and making sure Banyan was setting the highest standard in the industry," said Jon Tonko, Banyan's vice president of FBO services.

To further enhance his team's safety, Gibson recently led the first-ever safety standdown event with plans to continue this program quarterly. He also runs spotting procedure classes monthly.

Promoting Aviation

Gibson's choice of career was influenced by his father, who worked as general manager of airline services for Signature Flight Support. Gibson found himself immersed in the aviation industry at a young age.

"I grew up with a passion for aviation as my father was a GM for an aviation company and always brought me around airplanes. I was only 3 years old when I first rode on a tug on the ramp," he recalls.

In an effort to give today's youth the same exposure to aviation, Gibson participates in a number of events focused on children.

"We try to promote it as best we can," he says.

Gibson volunteers during the annual Challenge Air Fly Day event at FXE as well as the airport's annual Safety Day and STEM Fest for local students.

"I also contact local schools to allow their students interested in aviation to come and tour the Banyan complex and the airport. I am the head of the committee for Take Your Child to Work Day, and I enjoy creating a fun and safe itinerary of events for teammates' children to follow through the day," Gibson says. "It is a pleasure and honor to work at Banyan where the CEO truly cares about each teammate and actively participates in the growth of our industry." **GSW**

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For more information regarding the Team Leader of the Year, visit:

AviationPros.com/21254753

Rudy Yates

2022 Lifetime Achievement

The founder of Ground Support Specialist has dedicated himself to problem-solving and collaborating with others to improve the GSE industry.

BY JOSH SMITH

Rudy Yates likes a challenge.

"So I created one," he says with a smile, reflecting back on his decision to form his own ground support equipment company.

After gaining significant experience by engineering ground support equipment for FedEx, Yates founded Ground Support Specialist with his brother Fred in 1995. Yates grew the company from a small remanufacturing operation to a producer of a full line of deicers and other equipment. All the while, he promoted the industry in a number of ways, including serving on multiple committees aimed at making GSE safer and advancing the latest technology.

For his dedication and his contributions to the GSE industry, Yates has been recognized with *Ground Support Worldwide's* Lifetime Achievement award.

From FedEx to GSS

Yate's aviation career began in 1980 when he took a job as a draftsman at Federal Express. He became an engineer and from 1984 to 1995, he served as senior manager of GSE engineering of worldwide operations at FedEx.

"FedEx was a tremendous growth opportunity and learning experience for me as I was given the freedom to do whatever was necessary to excel the company forward with regards to ground support equipment," he says, noting he had a team of 17

Rudy Yates founded Ground Support Specialist with his brother Fred in 1995.

people supporting everything from technical manuals to custom-built equipment to troubleshooting equipment in need of repair.

"FedEx was an outstanding partner as they encouraged being the leader in advancing technology and staying on the leading edge," Yates continues. "This is what attracted me to a lifelong career in aviation and ground support equipment."

FedEx's Memphis hub was an exciting place to work, Yates says. And his team was responsible for all equipment that serviced or touched a plane when it was on the ground.

"At that time, people weren't typically trying to turn cargo airplanes as fast as we were. So, speed was of the essence, and we were tasked with coming up with equipment that would enhance that, which we did," he recalls. "My group wrote the specifications. We worked with SAE to ensure we were in compliance with everything. It was important for us to make sure that FedEx was on the leading edge of all the technology."

Yates recalls a specific example of working with ULD manufacturers to design containers that could better utilize the space available in order to load more freight.

"We actually came up with two or three ULDs that allowed us to maximize the cube and fly more cube – less dense, but more weight – to be able to load the airplanes down and get more packages from A to B," Yates says.

"Everywhere you turned – if you could do stuff like that, we did it."

In 1995, Yates retired from service with FedEx and set out to form his own company, Ground Support Specialist (GSS). Yates' brother Fred was a pilot with FedEx and agreed to help with the new venture.

"He helped by controlling the finance side of the business, which allowed me the freedom to control the manufacturing/engineering/working side of the business," Yates says. "It made for a really good fit."

As the chief manager of GSS, Yates built the company slowly. In the beginning, the company remanufactured equipment and provided some custom manufacturing for smaller products within in the industry.

"By the late '90s, GSS was manufacturing aircraft deicers for small FBO-type operators," Yates says. "Then in the early 2000s, GSS was approached by two major carriers in North America and the GSS line of custom-built deicers was born with the design and development of the GS700. Soon after, the GS800 was developed and international sales began."

The company continued to grow and today, GSS has a full line of custom-built, single-engine aircraft deicers, ranging from a 300-gallon trailer unit to a 2,100-gallon full-sized unit.

"GSS also builds a multitude of various GSE products including passenger trams, custom chassis, belt-loaders, brake coolers and more," Yates says.

Once a GSE remanufacturing company, GSS now has a full line of custom-built, single-engine aircraft deicers.

Yates appreciates his time with FedEx and the knowledge he gained there. But he says he's the kind of person that needs a challenge, so starting his own company was appealing. Starting conservatively by remanufacturing allowed him to overcome the initial challenges of running his own business.

"Probably within 12 months, we became our own biggest customer because I was buying used equipment, remanufacturing it and selling it," Yates recalls. "The proceeds from that provided the funds to design and develop the new products. That's where the GS320 and the GS700 and the GS500 – all of those – came from.

"Of course, I was very familiar with deicers from my past."

Collaboration and Contributions

In addition to the work he put into growing GSS, Yates made significant contributions to the ground support industry as a whole, regularly collaborating with other thought leaders in the market.

"The aviation industry, although massive in size, is in reality, a small industry controlled by a core alliance of professionals around the world," Yates says. "No matter where you go, the people in our industry are always working together to create a better and safer environment for both the handlers, operators and the public.

"No one gives out competitive information yet we all find a way to help each other."

He points to GSE industry professionals working with and helping George Prill start GSE Today, now Ground Support Worldwide. GSS was a charter member when the International Airport Equipment Manufacturers Association (IAEMA) was formed, which Yates says was an important step for the GSE manufacturers.

Yates was also involved in the formation of the SAE G-12 committee, which is designed to govern the SAE documents relating to deicing equipment, deicing fluids and other related materials.

"Before G-12, AGE-2 was all we had for GSE," Yates says. "The AGE-2 group realized the necessity for an additional group and we worked closely with SAE to form the G-12 group. Today G-12 has itself grown into a huge organization.

"Also during the late '80s, I had the opportunity to be the chairman of the ISO committee with regards to aircraft deicing," Yates adds.

He credits his counterparts in the industry for helping him improve and develop his engineering and manufacturing skills, noting he acquired a wealth of information from other members of SAE, IAEMA and the ground support industry.

Being willing to learn has been crucial to Yates' success, as he points to significant evolutions like advancements in deicing fluids.

While with FedEx, Yates and his engineering group worked with Dr. Renee Salvador to bring Type II deicing fluid – which has since been superseded by Type IV fluids – to the United States.

"We were the very first airline to bring it in," Yates recalls. "My vice president came to me and said, 'We will spray Type II fluid this winter.' We will? He said, 'Yes, we will.' So, we did.

"When we introduced that back in the '80s, we were trying to figure out what pumps to use and how to do it. You had to use positive displacement pumps, and you couldn't sheer it and you couldn't use a pump that you use for Type I fluid – a centrifugal pump – because it would tear it up," Yates continues. "It was quite a challenge."

"When we got to talking to Rudy, he brought a lot of years of experience of the special equipment that's needed on the GSE side," says Mark Kreutzfeldt, who along with Paul Treuthardt purchased GSS from Yates in 2021.

Kreutzfeldt describes Yates as the "grand poo-bah of GSE."

"If you go to a meeting or convention, everybody knows him," Kreutzfeldt says. "Everybody's worked with him or collaborated with him.

"In the airport industry, both the airfield side and GSE side, there's a group of guys that constantly want to get better and that's just a fun place to work when your customers, your end users, the vendors are all working together and trying come up with better solutions," he continues. "And that's what Rudy has been part of for years, as the SAE Group and those guys have worked together to come out with better solutions over the years."

Having handed over the keys to the company last spring, Yates continues to assist GSS wherever he is needed

"Mark and Paul are very familiar with equipment design and like equipment because they came from deicing – but it's runway deicing," Yates says. "They're learning the ropes with the aircraft deicing, and I assist them with that."

Yates is happy to stay involved as long as he is needed, but intends to officially retire in a couple of years.

Recess for Grown-ups

Reflecting on his time in the GSE industry, Yates says it has been extremely gratifying to work with other professionals toward a common goal.

"I feel my time spent around GSE has provided me with a unique perspective of aviation as I have a clear understanding of what it takes to make flights happen on schedule, and why sometimes there are delays that most of the general public cannot begin to understand," he says.

Yates recalls working together with others in the industry to solve challenges and combatting the phrase "We've always done it that way."

"That's when you really have to pay attention and work together to ensure any changes are best for all concerned," he says. "In the long run, it is most gratifying and rewarding when all concerns have been addressed. In order to accomplish this, sometimes tests may need to be performed to actually determine which way is best.

"That is one of the great things about this industry," he continues. "The people want to do what's best, so they willingly go the extra mile to make sure."

"The people that don't know him well or the new folks or whatever probably wouldn't have the appreciation for all the blood, sweat and tears of the development of products over the years that he's contributed to," says Kreutzfeldt.

When he looks back on his career in the aviation industry, Yates knows he couldn't have chosen a better group to have spent his time with.

"Simply put, the people of the GSE world are awesome," Yates says. "It has been a tremendous opportunity and I feel very fortunate to have been a part of such a group. My time in the aviation industry has been as enjoyable as being at adult recess." **GSW**

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Water Barrier Filters Drop In

The ATA 103 standard for jet fuel quality control has been updated to allow for the use of new water barrier filters and to phase out filters utilizing super absorbent polymers (SAP).

BY WALKER JAROCH

NATA

A differential pressure gauge.

Near the beginning of the year, Airlines for America (A4A) updated its ATA 103 standard for jet fuel quality control to allow for the use of water barrier filters and phase out filters utilizing super absorbent polymers (SAP).

A4A's update and the need to eliminate filter monitors containing SAP comes from several incidents where the material was found to be the cause of inoperability in aircraft fuel systems.

"Between 2010 and 2017 there were eight documented incidents in which SAP was identified as the cause of operability issues within aircraft fuel systems," says Steve Berry, manager of fuel quality and safety, National Air Transportation Association (NATA).

"Filters are supposed to be filtering out contaminants, not adding to it," he continues. "And then the decision was made that we need to phase them out. And then that started the process of looking for replacement technology."

The decision to phase out filter monitors began in 2017 and required a drop-in replacement given how ubiquitous they are in the industry. Estimates at the time, Berry says, showed around 85 percent of all aviation fuel filtration worldwide was filter monitors.

Dropping In

The new replacement technology to SAP – water barrier filters – has been developed by Parker Velcon and does just as the name suggests, repels water as opposed to absorbing it.

"The EI 1583 specification that came out many, many years ago, probably about over 40 years ago, was a filter design that used a media that trapped absorbed water and would not let it pass through. And this CDFX cartridge water barrier filter does not absorb water. It repels water. So any water that's in the influence side of the aviation fuel will be repelled and collected at the bottom of the filter vessel, as opposed to being absorbed into the filter cartridges," describes Robert Guglielmi, business development manager, global, Parker Velcon.

The water barrier filters are the same size as the existing filter and it fits into the filter housing the same way. There's no requirement to do anything differently to the filter housing. Guglielmi describes them as "plug and play," with the only difference being how they repel instead of absorb water.

However, that distinction means the new filters are somewhat different operationally.

"You need to do water checks every day to make sure if any water has been stripped away, that it is removed from the bottom of the filter vessel. And also, the differential pressure recording that operators have to do daily for all fuelings is slightly different," Guglielmi says.

NATA

A Velcon monitor filter vessel.

The change to differential pressure (DP) is the most significant change that the new filters bring to everyday fueling operations. With SAP filters, spikes in DP were cause for alarm, but not so much with water barrier filters.

"Historically with any filtration technology, differential pressure should only ever increase under the same flow rate, right? If you have a … [jump] in DP under the same flow rate, historically that's a giant red flag that something has gone on, that fuel is bypassing the filter," Berry explains. "With the water barriers though, because of the way they work, they don't absorb water. So, with that, if you had a slug of water come through and you had a spike in DP and then you drain that water off and the DP normalized, then that's acceptable."

"There may be at times where it is stripping water," adds Guglielmi. "The differential pressure will increase. And when that water is removed, the differential pressure could slightly decrease back to a lower pressure. And that's not any concern for alarm because it does a different application than the older monitor operation."

However, drops in DP are still a red flag and need to be addressed.

"Now you still need to be concerned if you go from, say, five [DP] to zero. That still means that something's ruptured or come unseated," Berry says.

No Mix Ups

Outside of the difference to recording DP, the other main consideration with the water barrier filters is not confusing them with the SAP filters that are being phased out, as the two filters look nearly identical.

"They are virtually indistinguishable with the exception of the markings on the end caps," says Berry. "One says CDF 230 and the other one says CDFX 230."

"So, if you start introducing the water barrier filter, you have to be very careful and thorough with the way you are storing them or marking them, or what vehicles have been transitioned over, converted over to the water barrier filter," Guglielmi says. "What we don't want and what the industry regulators don't want is to see mixing, and potentially mixing and matching of the two different technologies."

And it's more than just a hypothetical possibility – during field trials of the new filters, there was an instance of a mix-up occurring.

"They went to go pull some of the elements that were being tested in the field trials and realized, well, somebody put in monitor filters and not water barrier filters. So that segregated storage is important," Berry says.

"You need to be very cautious of what cartridges you're putting into your filter vessel and that you're not potentially mixing and using different cartridge designs," stresses Guglielmi.

Aside from DP differences and mitigating the risk of mix-ups, the filters are largely identical to the SAP filters.

"These cartridges are tested and approved to remove both contaminate and water levels within the specifications required. So again, there's no requirement for any additional equipment to do that. There's no additional monitoring equipment or any other equipment that is required to add to your system," Guglielmi says.

The filters are also tested for use with additives, as well.

For example, in the general aviation industry, fuel system icing inhibitor (FSII) is often used.

"It's an anti-icing additive, and fuel that is pre-blended with the anti-icing additive can now be used with this water barrier technology where it was not allowed to be used with the prior 1583 monitor," Guglielmi says.

Phasing In

As the roll out of water barrier filters continues, SAP filters are still being allowed at the moment.

"There's no longer specification for the water absorbing cartridges – the SAP monitor. However, they're still being used under a guidance from the ATA and JIG groups. And as long as they're following those guidelines and mitigating the risk, they can still continue using them for the time being," Guglielmi said.

The Joint Inspection Group (JIG) is allowing the use of SAP monitors through June 2023, after which they will no longer be part of their standard. Berry says he does not anticipate there to be widespread adoption of water barrier filters until closer to the 2023 date.

"I think the adoption rate is absolutely going to depend on when people can no longer use them, when they're no longer accepted into whatever standard it is that a refueling operator is operating to, and in the US, that's primarily the ATA 103," Berry says. "Outside the US, you've got that June 2023 date."

Berry says he anticipates the US to mirror the June 2023 timeframe for water barrier filter adoption. Adoption before then will likely be influenced by a company's cost analysis for switching filters.

"If I have up to a year and I'm due for a filter change, I'm going to save a few pennies and go with the technology that's still acceptable and still able to be used," he says. "But once that date occurs or you get within a year of that date, it wouldn't make sense to spend X number of dollars on monitor filters and then have to change them in six months and go with the new ones." **GSW**

Africa's Business Aviation Potential

With an increase in business aviation travelers, opportunities for ground service providers across the continent are growing as well.

BY MARIO PIEROBON

During the global COVID-19 pandemic, the business aviation industry has experienced significant growth, and this has also been the case in the Africa region.

With an expanding business aviation industry comes the increased need for business aircraft handling services. With this uptick in demand, current infrastructure, the provision of security services and opportunities for investment have been a focus for ground service providers in Africa's business aircraft handling sector.

Infrastructure in Africa

A defining preference of business aviation travelers is to move away from the standard experience, instead going through an exclusive private experience that enhances the overall objectives of their travel and creates a flexibility that regular flights do not offer.

According to officials with UAS Africa, however, some airport administrators and authorities in Africa do not fully appreciate this concept and prefer to place security considerations above anything else.

"In some cases, the funds are not just available to develop infrastructures for business aviation due to current volume

UAS INTERNATIONAL TRIP SUPPORT

As demand for business aviation increases current infrastructure, the provision of security services and opportunities for investment have been a focus for ground service providers in Africa.

of traffic, despite the potential that such facilities may hold for the future," say UAS Africa officials. "At African airports, FBOs or private terminals are not very common. In fact, VIPs and business travelers are often subject to the same immigration and custom procedures as regular airline passengers. This means that most times it is not convenient for VIPs and business travelers, and it erodes the ideas and experience associated with private or business travels."

The exclusive facilities that FBOs offer include private meeting rooms and lounges for VIPs who travel for short meetings lasting only a few hours and then returning, thereby avoiding chaotic traffic situations common in African urban cities, according to UAS Africa representatives.

"Other FBO features that are attractive to business aircraft include dedicated fuel services (and) easy access to light maintenance," they say. "We have seen the effects of these facilities in Nigeria and South Africa on the exponential growth of business traffic in these two countries in the last decade."

FBO features that are attractive to business aviation travelers include dedicated fuel services and easy access to light maintenance.

During the global COVID-19 pandemic, the business aviation industry has experienced significant growth.

Security Services

According to UAS Africa officials, aviation security threat issues are quite similar globally and exist in any region.

"Africa no doubt has its own share of such threats, which are unique and peculiar to Africa. The first threats are theft and pilferage of baggage and cargo," say officials at UAS Africa. "Poor baggage surveillance systems at some airports can lead some people to take advantage and steal valuable items and cargo."

When aircraft are parked overnight, for long periods in remote locations or at parts of airports with limited security surveillance, reports have been made of fuel thefts and removal of minor parts of an aircraft, according to UAS Africa officials.

"The 'stowaway' issue is a phenomenon often associated with Africa. People often take chances with this extreme but disastrous route," they say.

"These are often airport staff who have easy access to aircraft, or inhabitants of neighboring residential areas to airports who over time have discovered security loopholes."

Another threat for some airports that are located in the heart of a city, or which over time have been caught in developments around the airport, is that they could be compromised in terms of security, especially if they have fences that are not properly secured to completely ward off intruders, according to UAS Africa officials.

"For airports that are at quite some distance from a city and hotels and require passengers to travel long distances at night or odd hours, providing security escorts becomes imperative especially in areas with histories of insurgencies, banditry, wars and general insecurity," say UAS Africa representatives.

In certain parts of Africa there is also the need to prevent the infiltration by insurgent groups that mean to cause harm to passengers or airport infrastructure.

"These include Al Shabab in Somalia, Boko Haram in Nigeria Sahel region and others. We have seen a recent case in Kaduna, Nigeria where people were allegedly attempting to overrun and take over the airport but were repelled by security forces," say officials at UAS Africa.

For what concerns the movement of contraband, it is known that Africa is rich in minerals and valuable resources, observe UAS Africa representatives.

"Unscrupulous people move minerals like gold from its source to more lucrative markets by taking advantage of porous borders and corrupt government systems. Likewise, Asia is a ready market for rare animal species and trophies, and some people will use all means to move these through our airports to the markets," they say. "All these threats can easily be addressed by considering additional aircraft security on the ground. Operators may also want to consider

secured crew transfers with escorts. In general, however, most airports in Africa are generally safe and secure."

Investment Opportunities

Opportunities abound everywhere in Africa for investment in infrastructures, UAS Africa officials explain.

"In the area of FBOs, Africa lags other continents. FBOs in Africa are in only a few countries, yet they are the future of growing business travel. The long-term prospects are that the concept is gaining traction and many airport authorities are seeing the need to have public-private partnerships to develop FBOs," they say.

With Africa's growing fleets, aircraft maintenance is in high demand. But maintenance facilities are thin across Africa apart from Ethiopia and South Africa, which have comprehensive MRO facilities for large aircraft.

"Investing in MROs would surely be a great idea. Aircraft spares supply and distribution is another area which investors are overlooking," say officials at UAS Africa. "We have seen numerous AOG situations where aircraft wait on end to secure parts from Europe, America and even the Middle East for spares as simple as aircraft tires – all with very cumbersome customs clearing processes. Investments in this area would be worthwhile, too."

Additionally, many African airports have minimal parking space and cannot easily accommodate large aircraft.

"The high cost of airport infrastructure prevents them from making it a priority to develop and expand airport infrastructure. The effects are that despite economic growth on the continent, some countries will continue to rely on neighboring countries to ship in their goods by air or transport large numbers of passengers on planes," say UAS Africa officials. "This ends up being more costly for the economies. There is therefore a great opportunity in developing modern airports that can accommodate large and modern aircraft and terminal facilities for passengers."

Another opportunity is in upgrading airports with the latest technology to minimize time taken filling forms, checking in and other manual procedures.

"These include self-service check-in systems and automated passport control," note UAS Africa officials. "These are happening at some locations, and although very slowly, there are prospects of wider coverage in the very long term."

UAS Africa representatives say good hotels near airports create a multiplier effect of business and infrastructural developments around the airports.

"Hotels are an integral part of the travel industry and with growing urbanization, which is also rapidly creating situations of chaotic traffic jams and insecurity. Airport hotels are becoming popular. Unfortunately, investments in this area are still slow," say UAS Africa officials.

Catering is also imporant to consider.

"It may be shocking to know that there are still quite a few major international airports in Africa where one cannot get catering items as minor as ice, except if one procures from the city or the hotels," say officials at UAS Africa. "Even where catering companies are available, their leaning tends to be towards the regular commercial airlines catering where the volume is. Specialized business or VIP catering could be the way to go." **GSW**

ABOUT THE AUTHOR

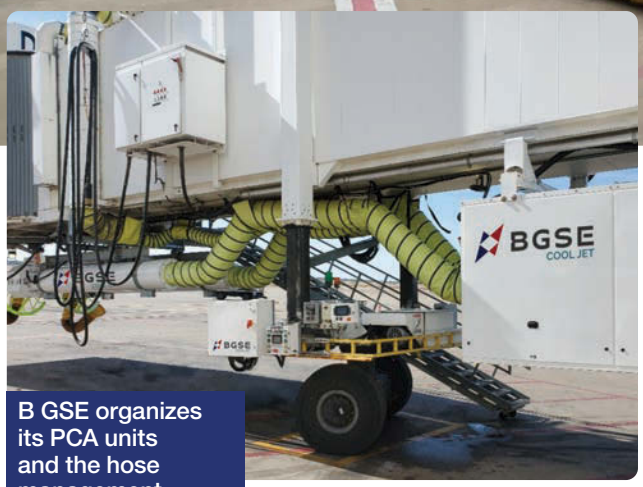
DR. MARIO PIEROBON

Dr. Mario Pierobon provides solutions in the areas of documentation, training and consulting to organizations operating in safety sensitive industries. He has conducted a doctoral research project investigating aircraft ground handling safety. He may be reached at mariopierobon@az-all-in-one.com.

PCA Hose Extending and Retracting Made Easy

B GSE has begun manufacturing the CoolJet Hose Retriever after researching systems in Europe and working with Aviation Technical Equipment Supplies.

By Rebecca Kanable



B GSE organizes its PCA units and the hose management systems, both single and dual arrangements, to provide additional space under the passenger boarding bridge.

A pre-conditioned air (PCA) hose can have its share of problems. Considering 91 feet of hose weighs about 1,000 pounds, it can be heavy. Hoses are often unwieldy, may kink and get wet and dirty.

To address those problems, B GSE Group, whose core business is system engineering and commissioning, started manufacturing the CoolJet Hose Retriever, a pre-conditioned air hose handling system.

The CoolJet Hose Retriever makes the process of extending and retracting the hose easier and faster, increases hose performance, and allows ground personnel to utilize just the amount of PCA hose needed, limiting hose wear and tear.

To operate the system, B GSE president Bryan Bullerdick says an operator presses a button on a remote, which is mounted to the aircraft connector at the end of the hose, while walking to or from the aircraft. This allows the user to retract or extract the hose with little effort. The remote control operates on a "dead-man" switch concept that requires a continuous press of the button to maintain motion.

While other hose handling systems have reels and baskets, the CoolJet does not. Therefore, there's no lifting or rolling of the hose required.

Bullerdick says B GSE set out to focus on customer operational challenges related to hose handling and lifespan. A goal, he says, was to develop the easiest and fastest method to extend and retract the PCA hose. The method chosen also increases hose performance and ultimately assists customers in their tactical need to condition the aircraft and their strategic desire to turn off the auxiliary power unit (APU) and diesel-powered ground support equipment, he says.

Before B GSE started manufacturing the CoolJet Hose Retriever in the United States, the company researched hose management systems, which have been popular in Europe for about two decades. Bullerdick notes competition for the best product has been robust with at least four competitive offerings in that region. B GSE reached out to users of these systems in Europe and in 2017-18 talked to the system manufacturers.

"Our due diligence in investigating proven technology led us to the ATES [Aviation Technical Equipment Supplies] design with a 20-year track record," he says.

B GSE found customer reviews of the ATES SHR PCAir Hose Retriever manufactured in Italy were favorable, with end-users praising the durability, size, weight and flexibility of the installation. In 2019 B GSE and ATES signed an agreement for B GSE to own the rights to manufacture the hose handling system in the Americas.

Bullerdick says key features of the system include a remote wireless control panel, a backup local control panel, touchscreen maintenance human-machine interface (HMI), adjustable speed and a compact design that allows the unit to be mounted under the passenger boarding bridge cab.

Installing the CoolJet Hose Retriever unit directly under the cab of the passenger boarding bridge, according to Bullerdick, is "an advantageous location relative to the aircraft connection ports, an ideal location for the inlet from the PCAir unit and the best arrangement to balance loads on the passenger boarding bridge.

According to Bullerdick, CoolJet Hose Retriever units have been integrated into passenger boarding bridges for two

The B GSE CoolJet Hose Retriever deploys only the amount of hose needed.

B GSE Group began manufacturing the CoolJet Hose Retriever in 2019 in Morgantown, West Virginia.

popular passenger boarding bridge manufacturers in the U.S. In addition, he says the company has supplied combination mounting systems to include mounting 400Hz and cable coilers – all organized under the passenger boarding bridge cab.

Main Components

The main components of the CoolJet Hose Retriever system include the hose, which is a flexible fabric hose made with yellow PVC with an insulating layer. The hose sections are joined by a zipper and a protective band with Velcro. Standard hose lengths are 68 and 91 feet, while other lengths are available upon request. The width of the hose is 35.5 inches.

Four individually powered ribbed belts run along the outside of the wire-wound spiral hose and draw the hose into a storage tube. Bullerdick says extraction and retraction processes are smooth as a drivehead uses four concentric drive belts powered by four speed-controlled motors. The hose system's speed is programmable, and sensors stop the hose when it is fully extended or retracted.

When the hose is in motion, the hose management system (HMS) is interlocked to the PCA to prevent it from running. The HMS also is interlocked to the boarding bridge to prevent it from moving until the hose is fully retracted.

Only the amount of hose required needs to be extracted, which Bullerdick says is often much less than the total hose length. With a shorter hose and less need to bend or kink the hose, there also is less temperature loss.

When not in use, the hose is protected in the storage tube, reducing overall hose wear.

The PCA unit is oriented in the optimal position for airflow, Bullerdick says, thereby reducing pressure and thermal loses.

"HVAC is a precious commodity," Bullerdick says. "The moment the air leaves the source of production, it is either warming up, cooling off or slowing down, which in all cases is not in the direction you want it to go. In developing an HVAC or PCA system, your system needs to look at how to improve delivery. General rules in developing a good or great system include: limit distance of delivery, limit how many times you have to change directions of the airflow and look to eliminate any restrictions or kinks in delivery. The system B GSE has put together is the most direct, straight and obstruction-free path from the PCA unit and the aircraft. B GSE has studies that show airflow and air temperature improvements of 20 percent or more compared to any other system installed. Having a system design that improves performance by 20 percent means there are consequently energy efficiencies. The design and materials used in the CoolJet HMS unit additionally help minimize losses by ensuring smooth, corrosion-resistant airflow."

System controls include the electronic control and command panel, installed at the foot of the gangway, which houses the fixed control devices – including a diagnostic touchscreen and local redundant operator control panel. Also included is a radio control system with a wireless transmitter mounted on the HMS body, and a wireless receiver and remote operator panel mounted on the aircraft connector of the hose. The transmitter contains the extraction and retraction controls.

"The CoolJet has been very well received," Bullerdick says. "We have worked very closely with our customers in launching this product in the USA since 2019 and we have found the design to be robust and reliable, as expected given the 20-year history overseas. The results have been impressive with the ability to fit on almost any passenger boarding bridge with minimum impact to bridge wear and maintenance while greatly increasing the use of our customers investment in 'green' GSE technology.

"On several occasions the operators would describe to our technicians how effective and useful the product is. One even approached us while changing a hose because he was concerned we were taking it out of service and he didn't want to lose it." **GSW**

Product Hangar

JETLINKSYS
UNITRON POWER SYSTEMS

Unitron Power Systems presents the JetLinkSys, a self-contained cable management system with a 400Hz, 28VDC, 270VDC or combination solid state frequency converter. The system is available in an overhead, fixed or towable configuration.

AviationPros.com/21263730

400HZ RESISTIVE AND REACTIVE LOAD BANK
MCM ENGINEERING, INC.

MCM Engineering 400Hz load banks allow for the proper and complete testing of any ground power source. Built for decades of dependable use, the enclosure and controls can be customized to fit unique customer requirements. Each load bank has accessible individual step loads and test points. Easy to operate and maintain, it's available with carts, trailers and cooling options.

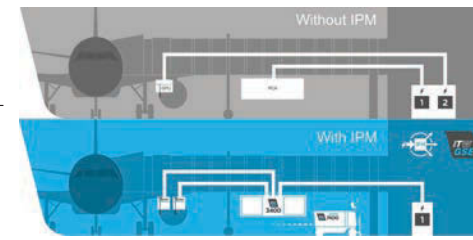
AviationPros.com/21264911

ATTACHABLE AND MOLDED GSE CABLE ASSEMBLIES
U.S. AIRMOTIVE GSE

U.S. Airmotive GSE cable assemblies for AC and DC applications feature silver-plated copper alloy contacts and military-qualified cable. Connectors include an insulating sleeve around power contacts. All cable assemblies are fabricated to MIL-C-7974C. Qualified source of supply for AS(MS)25019, AS(MS)90328, AS(MS)90347, AN3430 and AN2551 cable assemblies; AS(MS)25486 and AS(MS)25488 connectors. A complete line of ground power cable assemblies and attachable aircraft connectors are available, and U.S. Airmotive GSE supplies custom configurations to meet any requirements.

AviationPros.com/21265075

INTELLIGENT POWER MANAGEMENT (IPM)
ITW GSE



IPM is a complete gate system allowing airports to utilize their gate power infrastructure smarter, especially for airports that have reached their power capacity limits. The 3400 PCA is the brain of the IPM gate system. It manages the complete process and ensures that users never exceed the gate power capacity. The IPM offers advantages, including cheaper installations, less complexity, easier gate upgrades and the possibility of charging eGPUs.

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SHENLING'S PCA UNIT
GUANGDONG SHENLING ENVIRONMENTAL SYSTEMS CO., LTD

This PCA Unit combines decades of knowledge and know-how in the HVAC field, with features of small size, environmental friendly, long service life and easy operation.

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TUG TMD AIR STARTS
TEXTRON GSE

TUG TMD Air Starts offer 150 to 270 pounds of continuous airflow per minute. The TUG TMD line is equipped with standard features, including on-demand automatic engine throttle, full-length access doors and an illuminated LCD operator control panel with gauges.

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GB45/20 COMPACT GROUND POWER UNIT

GUINAULT

Specially designed at conception for military use, the Guinault compact ground power units are a perfect solution for providing 400 Hz or 28 VDC electrical power for regional aircraft. The compact units offer the strong performance of the dual voltage Guinault alternator, which makes it possible to use an oil-cooled Deutz Compact engine, without water cooling. Maintenance and fuel consumption are reduced. The 9-phase Guinault alternator provides a high quality direct current (18 pulses).

AviationPros.com/21261321

RAMPTECH IBS LITHIUM-ION BATTERY

SAGE PARTS

The RAMPTECH IBS Lithium-Ion Battery provides electric power drop-in solutions for lead-acid battery vehicles. IBS technology allows for 30 percent more on-ramp usage than lead-acid batteries and is GSE ready and built to withstand all ramp conditions. RAMPTECH IBS is engineered to outperform other batteries while minimizing ownership costs for GSE operators. RAMPTECH IBS features an innovative modular design for specific GSE applications, longer battery life and quick-charging capability.

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MOBILE REACTIVE LOAD BANK ALB-I-56DW (O-56 KVAR_400 HZ AC)

DEKAL LOAD BANKS L.L.C.

The ALB-I-56DW is a unique testing equipment unit for civilian and military applications. It allows any operator to perform an extensive load test and captures a real-time PDF data table to verify values simultaneously. The unit complies with MIL-C-81790 specification, is suitable for workshop or airside operations and is backed up by a two-year warranty. It is designed to be either mobile (enclosed wheels) or fixed with threads on each bottom corner to place it as required. The reactive unit may be connected to any Dekal resistive load bank, despite the model. It has been engineered by a new patented concept with slide-in option to simply attach resistive 400 Hz AC. Engineered in accordance with the STANAG 3456(7) and MIL-STD-704F, it is intended for testing and diagnosing various 400 Hz AC power sources with lagging power factor.

AviationPros.com/21233924

BOOM AIR HOSE MANAGEMENT SYSTEM

TWIST AERO

The Boom Air Hose Management System is an automated hose delivery system, which connects into the pre-conditioned air unit and delivers heated or cooled air to the plane. The unit enables the operator to only deliver the amount of hose needed to the aircraft via a handheld remote. This reduces kinks and other hose-related issues, resulting in optimum airflow to the aircraft. To date, there are more than 400 systems installed in the United States, Canada and Europe.

AviationPros.com/21110598

HAND CRANK PCA DUCTING REELS

REELCRAFT INDUSTRIES, INC.

Reelcraft's PCA reels handle 75' of 14" I.D. pre-conditioned air ducting and are designed for ergonomic handling of air ducting. When properly installed, Reelcraft's PCA reels supply continuous clean pre-conditioned air to stationed aircraft, keep expensive PCA ducting protected and improve safety on the tarmac. Aluminum construction and a safety yellow, baked-on powder coat finish combine to provide corrosion resistance. Heavy-duty casters are available for easier mobility.

AviationPros.com/21158953

28.5V DC TIER 4 FINAL DIESEL GROUND POWER UNIT

TRONAIR INC.

Tronair's Tier 4 Final Diesel GPU simultaneously uses the 400Hz AC system and 28.5V DC system; powered by a Doosan engine and three-year warranty. A digital display and diagnostics module monitors key metrics. One-button operation reduces training and maintenance costs.

AviationPros.com/12436419

ZEPHIR PCAS

ADELTE

ZEPHIR PCAs are designed and engineered to deliver optimum airflow to each aircraft, with an increased efficiency of up to 35 percent using two inverter compressors with four phases and a high-quality direct drive centrifugal blower (VFD) consuming minimum energy. They fit any platform layout and can be installed on any PBB.

AviationPros.com/21096708

AIRCRAFT 400HZ ALTERNATOR

WEG ELECTRIC CORP.

WEG 400Hz alternators are especially designed for aviation ground power units driven by reciprocating engines. The robust and compact flying lead configuration allows for seamless and flexible integration into GPU package designs while ensuring long-term reliability in the field.

AviationPros.com/21242241

L-100D LOAD BANK

CANNON LOAD BANKS, INC.

This 400Hz 100kW load bank is designed for testing aircraft ground power units. The load bank has eight different loads and full load can run indefinitely. The unit only weighs 45 pounds.

AviationPros.com/21242218

PCA HOSES

AMCRAFT MANUFACTURING INC.

AmCraft Manufacturing fabricates pre-conditioned air (PCA) hoses. The company offers wire-supported hoses and lay flat hoses. Both are intended to assist with the movement of conditioned air (either cool or warm). AmCraft manufactures a complete line of standard size hoses, hose sections and hose accessories. AmCraft can also customize hose configurations to fit specific needs.

AviationPros.com/21159203

D70 OVER-MOLDED BATTERY CONNECTOR (EURO)

ANDERSON AIRMOTIVE PRODUCTS CO.

The Anderson Airmotive Products Co. Series D70 Over-molded Battery Connector (Euro), per the DIN43589-1 specification, provides users with a true watertight configuration for fast battery charging systems. A first-of-its-kind connector that is over-molded on the cable to provide users with an IP65 solution that ensures performance in severe battery environments. Key features include compatibility with other DIN43589-1 battery connectors; silver plated copper alloy contacts for electrical performance; manufactured with durable synthetic rubber for long life; provides up to four auxiliary contacts; tailorable to user needs for cable gauge and cable assembly length.

AviationPros.com/21233941

START PAC GREEN

START PAC

The Start Pac Green is a unique modular battery-powered ground power unit to replace diesel- and gas-powered units. Features include a larger battery bank for powering up aircraft systems for extended periods of time; a smaller battery bank for engine starting; the starting battery bank can be removed from the ground power unit when a portable unit is required and built-in battery chargers to replenish both battery banks.

AviationPros.com/21112662

MOTOR-GENERATOR 400HZ FREQUENCY CONVERTER

KATO ENGINEERING, A NIDEC BRAND

Kato Engineering has manufactured motor-generators for 90 years, and for more than 25 years MCM Engineering has been the preferred partner for 400Hz rotary frequency converters for aviation central systems. Commercial airlines and military forces around the world use Kato Engineering motor-generators for a reliable source of power for frequency conversion.

AviationPros.com/21158936

JETGO 900

AERO SPECIALTIES

The AERO Specialties JetGo 900 is part ofthe company's line of JetGo aircraft ground power units. Utilizing modern production methods and materials, AERO Specialties has created this 28V GPU. The all-new futuristic design, active aircraft safety features and reliable performance ensure that the JetGo 900 is a quality choice for 28V ground power requirements.

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BANDED POWER CABLE ASSEMBLIES

PAGE GSE

PAGE GSE is proud to introduce its safe, robust banded 400Hz and 28VDC cable assemblies. These ergonomically designed connectors incorporate cutting-edge technology unique to the GSE industry.

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AMPJET GROUND POWER UNITS

ADVANCE GSE CORP

Ampjet offers end users the flexibility of building their GPU the way they want it along with a two-year standard warranty along with a wide range of options, not commonly found with others.

AviationPros.com/12434219

S POWER M-B-DC

HITZINGER GMBH

The mobile version of the Hitzinger S POWER provides high voltage quality and highest level of supply security anytime, anywhere. The S POWER M is available either for indoor use (S POWER M-S) or outdoor use (S POWER M-B). The latest 28VDC technology can be added to all available S POWER units. Due to the latest inverter technology, the unit fulfills all technical requirements and overloads and is still very lightweight and compact.

AviationPros.com/12434733

RHEINMETALL EMSU

RHEINMETALL LANDSYSTEME GMBH

Rheinmetall introduces a 100-percent electric air start unit. The Rheinmetall eMSU represents a zero-emission solution that meets green initiatives. The new eMSU air start unit offers an airflow capability of 250 ppm and performs in any climatic conditions. This eco-friendly solution comes with a fast battery charging system and high-quality components with low maintenance requirements.

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28 VDC GROUND POWER UNIT

CURRENT POWER LLC

Current Power LLC is a leading manufacturer of 28 VDC power supplies for corporate, military and commercial customers. The company is known most for its 600 and 400 amp mobile units. These units provide 2,000 and 1,200 amp peak starting current and an exclusive re-connectable input. The 600A mobile unit makes a single model useable around the world, on any 50 or 60Hz power.

AviationPros.com/21243561

PCA REELS AND DUCTING

HALL TECHNICAL SERVICES

Hall Technical Services' Xtreme PCA Hose is the latest in hose technology to combine extremely durable, lightweight materials into a ramp-ready PCA hose. The Xtreme PCA Hose is designed for the tough ramp environment with reinforced seams that are lock-stitched with new improved high-strength, UV-protected polyester thread to prevent breakage.

AviationPros.com/21158963

400HZ SINGLE JACKET CABLE

PHILATRON WIRE & CABLE

This 400Hz Single Jacket Cable Assembly is UL listed and offers a double-belted, reinforced neoprene jacket and +125°C rated flame-resistant conductors to help prevent overheating, shorting and fire. The assembly offers -40°C degree performance. Additional features include M Class extra-flexible copper stranding, anti-corking design, tough rock-hard replaceable nose, silver-plated copper contacts, a modular design. The assembly is ISO /IATF-certified.

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GPU SERVICE

SERVICORE GS CORP

Servicore G.S. Corp provides service to ground power units (GPUs) including calibration, load bank test and overhaul. All services are performed by trained technicians.

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400 HZ CABLE

SERVICE WIRE CO.

Service Wire Company's six-around-one twisted 400 Hz cable is specifically designed to power modern airports and hangars. The unique cable is an assembly of multiple soft drawn copper conductors, stranded and insulated with cross-linked polyethylene, twisted in a six-around-one construction and phase identified per customer specifications. Used as a power source for aircraft ground power supplies at airport terminals, mainframe computers, TV and radio station output power supply, and other similar applications. 400 Hz cable is available in #4 AWG through 500 Kcmil, 600V/1kV XHHW-2 and 1kV USE-2/RHW-2.

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JETMAX600

AEROMAX GSE INC.

The most compact and maneuverable Aeromax GPU, the Jetmax 600 is made with high-strength steel and large doors provide easy access to all maintenance components. The unit is powered by a Perkins diesel engine and Marathon alternator for increased reliability. Additionally, a smart digital controller monitors oil life, hours and fuel level all in one screen. With an illuminated digital display, GPU parameters are always clear and visible.

AviationPros.com/12432148

STAND, DIESEL AND ELECTRIC MOBILE ACUS

VERDE GSE

Designed with multiple systems and ease of maintenance, Verde's line of ACUs support any military fighter, select cargo and bomber aircraft. Verde's ACUs support the F15, F16, F18, F35, P-8, C130J, B1B, T50, FA50, and EFA Typhoon Mirage. Features include: Pressure from 1-13 PSIG, 25-90 Nominal tons, 18-55 grains of moisture and airflow from 34-600 PPM.

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Ground Support WORLDWIDE

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Historical Highlights of the GSE Industry

As Ground Support Worldwide continues to celebrate its 30th year, we look back at key moments in the industry's history.

BY JOSH SMITH

As part of our publication's anniversary celebration, we wanted to look back at key moments in the GSE industry. So, we're revisiting the ground support retrospective article former editor Steve Smith wrote in 2013. Take a look at this brief sampling of various GSE milestones and be sure to read Steve's comprehensive article in its entirety at www.AviationPros.com/10863157.

1705 – The Goldhofer family starts a forge in Amending, Germany.

1860 – What eventually will become the TLD Group begins with a silk-weaving business in Lyon, France.

1902 – Wilbur Wright becomes the world's first ramp agent as Orville Wright took off from the sand at Kill Devil Hills aboard the Wright Flyer.

1928 – Two years after founding Kato Engineering, owners Elmer Jensen and Louis Wilkinson hire Cecil Jones, who develops a rotary converter that lets rural families operate AC appliances with DC storage batteries.

1935 – E.P. "Ed" Grime starts the Malabar Machine Co. In just a few years, Lockheed asks Grime to build the first tripod jacks specifically for aircraft.

1939-1945 – Aviation has a huge impact on the course of World War II and the war has just as significant an impact on aviation. More names of well-known GSE manufacturers can be recognized.

For example, the Northwestern Motor Company – the "NMC" of NMC-Wollard – introduces a tow tractor. Stewart & Stevenson builds hundreds of tractors for the Air Force. Columbus Jack gets its start selling most of its production to the military. The David Clark Co. begins specializing in protective equipment.

In the 1950s, TracMa introduced a new type of tractor for the aviation market.

1945-1959 – Commercial aviation starts to take off. By this time, a host of international GSE manufacturers are well on their way to building specialized equipment for commercial aviation.

Wilt and Violet Paulson start the Willamette Aircraft and Engine Co., which later becomes better known as LEKTRO. Garsite, LLC starts manufacturing aircraft refuelers, hydrant dispensers, fuel delivery trucks, above-ground fuel storage tanks, aviation fueling systems and vacuum pumper trucks. Jim Kaplan starts Harlan Corp. to rent and rebuild lift trucks.

1960 – FMC Corporation's engineers start building some of the first deicer vehicles that use aerial devices to spray aircraft.

Clyde W. Olson starts Clyde Machines Inc. and full production of GSE begins shortly thereafter.

1963 – U.S. Airmotive GSE begins providing a full line of GSE parts and supplies for the industry.

1968 – Robert Watkins starts General Transervice Inc., an airport refueler maintenance company at PHL.

1969 – Eagle Tugs introduces its bobtail cargo tractor, a model still in production.

1972 – SAGE Parts opens to distribute parts and service for the GSE industry.

1973 – TUG Manufacturing Corp. is founded.

1979 – Jim Watkins starts WASP, Inc., specializing in non-motorized GSE.

1987 – Matt Sheehan starts AERO Specialties, a manufacturer and distributor of new and used GSE throughout the world.

1990s – George Prill starts GSE Today.

TLD creates its GSE division and acquires TracMa, Albret Industries, Erma, Devtec and Lantis. By the end of the decade, TLD decides to specialize in GSE. **GSW**

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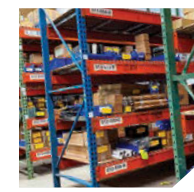

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