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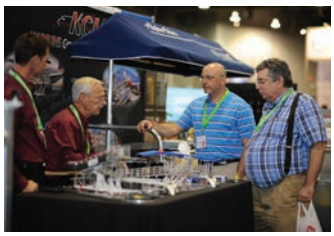




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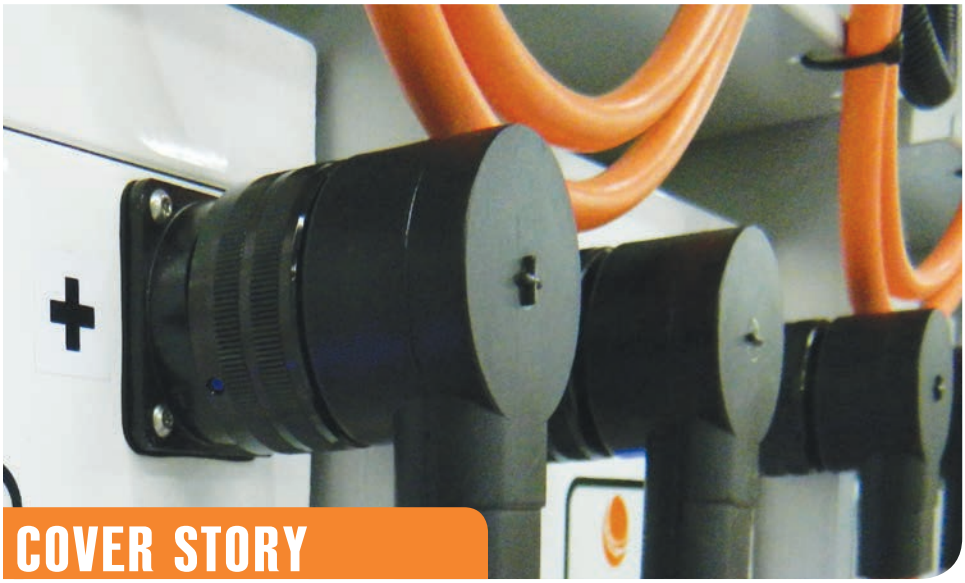

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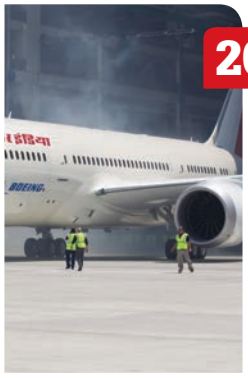

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Business Buzz

Hobart, J&B Aviation And ITW Military GSE Join Forces

To strengthen its position in the market place, Hobart Ground Systems, which includes Hobart, J&B Aviation and ITW Military GSE, all owned by ITW and part of Illinois Tools Works, today announced that it has joined forces with the ITW GSE companies outside Americas under the name of ITW GSE.

The company emphasizes that the products of the ITW GSE will still be branded Hobart, J&B Aviation and ITW Military GSE and that customers will continue to work with the people that they already know. This transition will be occurring throughout the remainder of 2014.

"One year ago, we aligned our group structure to have a global ITW GSE R&D as well as a Global ITW GSE Sales & Marketing department. We are now taking the next natural step to meet the requirements from the changing global GSE market. Our customers who are also global, will benefit from a more efficient, focused and streamlined organization that will help us be a best-in-class company," states Poul Elvstrom, Vice President of Global Sales and Marketing for ITW GSE.

"We will be better able to provide our customers with innovative solutions and the latest technology within 400 Hz power supplies and accessories, products that are critical to ensuring on-time aircraft departures. Further, the financial strengths of the ITW Inc. – a Fortune 200 global diversified company, make ITW GSE a very strong player with whom customers can safely do business."

Hobart, J&B Aviation and Military are headquartered in Palmetto, Florida and make up the ITW GSE Americas region. J&B Aviation has manufacturing and warehouse facilities in Santa Rosa, California with sales and administration in Palmetto, Florida.

Swissport Targets The Youngest Jet Set

Swissport's Aspire lounge in Manchester Airport Terminal 1, has been designed with the world's first play-tech pods for young children.

Courtesy of a relationship with the children's character Airside Andy, this innovative new collaboration, designed to keep children entertained during airside waiting times, sees the introduction of child friendly tablets, preloaded with Airside Andy fun and adventure along with other mainstream games. Housed in a child friendly baggage carousel, the tablets protrude from real suitcases on bendable poles creating a unique and fun play area for children.

Swissport plan to roll-out the pods in all airport lounges in the UK.

Swissport has opened its lounge doors to Airside Andy in recognition of the need to create a space for children. The ground service provider plans to roll-out the pods in all its UK airport lounges.

Dnata earned an RA3 certification for its ramp services at Ninoy Aquino International airport. RA3 is short for 'Third Country EU Aviation Security Validated Regulated Agents,' a supply-chain security initiative of the European Union. dnata is one of the first ramp operations providers in the country to receive the RA3 certification. The certification – granted by EU-approved and trained validators – confirms the procedures dnata implements are compliant with EU-requirements.

Liquid Controls announced the creation of the Aviation Business Line, a team of Liquid Controls employees dedicated to providing into-plane fueling and airport bulk fuel management solutions. With their new, singular focus, the Aviation Business Line team will now have the freedom and resources to provide swift, well-informed service to their partners in the aviation industry.

Cal/OSHA fined **Menzies Aviation** $77,250 for three serious accident related, one serious and one regulatory violation following an investigation into the February death of a worker at Los Angeles International Airport, who was thrown from the vehicle he was operating without a seatbelt. Cal/OSHA's investigation determined that Menzies' safety policy on the operation of tow tractors in and around LAX did not require, and in fact discouraged, the use of

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safety belts in certain areas of the airport. Menzies Aviation also inaccurately reported the fatal accident to Cal/OSHA as a heart attack. Regulations require employers to accurately report work-related fatalities within eight hours to Cal/OSHA.

Telford Design redesigned its website, www.telforddesign.com, to include videos of all new and updated equipment.

Xced Aviation Services, LLC, announced the opening of its Canadian subsidiary- Xced Aviation Services Canada. With the launching of our Canadian subsidiary Xced Aviation can provide single investor equipment financing solutions and life cycle management of all GSE throughout the United States and Canada.

Menzies Aviation Opens Pharma Cold Zone Facility At Kempegowda International Airport

Menzies Aviation Bobba, operating a cargo terminal at Kempegowda International Airport, Bengaluru, has opened an exclusive Pharma Cold Zone on for the handling of pharma products.

Bangalore is emerging as an important pharmaceutical hub in South India. To support the demands of the growing local industry, which now has a strong global presence, Pharma Cold Zone will offer accurate and temperature controlled care while handling pharmaceutical products. This temperature controlled cargo handling facility will greatly assist the south Indian pharma industry in enhancing their business and meeting the stringent requirements of global regulatory authorities.

The state-of-the-art facility provides dedicated truck docks for acceptance, floor-level weighment at acceptance, customs clearance, screening and security clearances, cargo build-up and storage, all under controlled temperature. It is also equipped with data loggers, alarm systems (hooters and SMS) and 24/7 CCTV coverage supported with HD cameras.

V.S Bobba, managing director of Menzies Aviation Bobba, said, "With the new and exclusive Pharma Cold Zone facility at our cargo terminal, with temperature controlled and state-of-the-art technology, the company would strengthen its leadership and capability in handling and transportation of pharma cargo between Bengaluru and rest of the world."

Venkata Reddy, CEO of Menzies Aviation Bobba; Sandeep Prakash, Commissioner of Customs Bangalore; and, V.S Bobba, Managing Director of Menzies Aviation Bobba, take part in the official opening of the new facility.

In a letter to its customers, suppliers and partners, Dan Clevenger, global director of sales and marketing, said **Liquip Aviation/Beta Fluid Systems** was not a part of recent acquisition of Liquip International Pty Limited by OPW. The acquisition is limited to three Australian Liquip businesses:

- Terminal Equipment, Sydney, Australia: Equipment for the petroleum, LPG, and mining industries.
- Spare Parts and Maintenance, Sunshine, Australia: Serving aviation customers in Australia / New Zealand.
- Fuelling Solutions, Port Melbourne, Australia: Filtration systems and vessels in Australia / New Zealand.

Liquip Aviation continues to operate as Beta Fluid Systems and will continue to operate out of the North Carolina. To avoid confusion with the new OPW/Liquip brand, Beta Fluid Systems will strategically begin phasing away from the Liquip brand, with a full brand transition to be completed by 2015.

Etihad Cargo launched SkyStables, a new service targeted at customers around the world wishing to transport horses and other similar species by air. The service is being rolled-out across Etihad Cargo's scheduled network of 44 freighter destinations with personalized charter services to other cities also available. Horses travel in dedicated stalls equipped with anti-slip floors, which are then loaded in temperature controlled sections of the aircraft. Throughout the flight, the animals can be attended to by their grooms, ensuring arrival at their destination fit and healthy.

United Airlines plans to lay off 49 ramp workers at Detroit Metro Airport by Oct. 1 and transfer their work to an outside vendor. The affected positions also includes 51 customer service representatives and various other positions. The carrier said the layoffs are needed "to have sustainable financial success and run an efficient and reliable operation." The notice did not identify the new vendor or specify whether the workers could find jobs there.

Elite Line Services launched a new, comprehensive web store, www.elsparts.com, to provide 24/7 access to more than 18,000 parts and accessories for material handling and airport baggage handling systems. ELS designed the web store to provide the following benefits:

- Competitive pricing on OEM and 3rd party parts
- A robust search feature
- Access to order history
- Product suggestions
- Payment via major credit cards on a secure site

The site offers many airport baggage handling items including pulleys, bearings, clutch brakes, belting, gear motors, reducers, bar code scanners, sprockets, and bushings.

Sage Parts joined with **Menzies Macau Airport Services Ltd.** to open a new Sage parts and services facility at Macau International Airport. In the past year, Menzies Macau has handled the aviation demands of 5 million passengers and approximately 45,000 tons of cargo. Sage and Menzies Aviation have already work together to open other facilities in Los Angeles and Johannesburg. In other news, Sage also collaborated with dnata Singapore to open a facility at Changi Airport. The ground service provider serves

more than 30,000 flights annually at Changi Airport.

DAS Handling Ltd, a ground service provider at Entebbe International airport, has completed the International Air Transport Association Safety Audit for Ground Operations. "This is an important milestone for our company. It is an illustration of our commitment towards providing worldclass services to our customers with special attention to safety at the highest standards," said Marc Deleu, the managing director of DAS Handling Ltd.

Universal Weather & Aviation's attempt to form a joint-venture company in India to conduct its own ground handling services has been rejected by Indian authorities. The Houston-based company has operated in India, providing trip support for the past decade, with its agents acting in a supervisory role for the local ground handlers it uses. Indian regulations state, however, that 100-percent foreign equity is not allowed for ground-handling providers.

Rickenbacker International Airport will lease space to **Consolidated Aviation Services** in a development that puts Central Ohio a step closer to direct exporting to Asia and Europe. CAS, based at John F. Kennedy International Airport in New York, will manage outgoing cargo shipments at Rickenbacker beginning in this month.

New Deals

Malabar International acquired DAE Industries. DAE is a manufacturer of engine stands and other ground support equipment, including docking systems. DAE also provides leases and refurbishment for its engine stands. Its docking systems are custom engineered and built to meet customer needs.

Avfuel Corporation expanded its branded FBO network with the addition of Apex Aviation at Vernal Regional Airport in Utah and Wells Aircraft at Hutchinson Municipal Airport in Kansas. Both FBOs will have full access to Avfuel's training and operational systems (including fuel safety and customer service training, transaction processing systems, marketing programs and more) and will offer Avfuel

Contract Fuel and AVTRIP loyalty rewards.

Liquip's Beta Fluid Systems Division, completed the 100 percent on-time delivery of 50 aviation refueler modules and hydrant dispenser carts for Pertamina Aviation, the aviation fueling division of Indonesia's national oil company. The contract was part of the largest single contract in the world, awarded in October 2013 with seemingly impossible delivery requirements and heavy performance penalties for late delivery. Not only did the company deliver the contract on time, but over 50 percent of the units were completed well ahead of schedule. Pertamina Aviation manages all commercial aviation fueling at Indonesia's 230 airports. With over 13,000 islands, and many of those airports operating as key economic links between hundreds of remote islands, equipment reliability is of primary concern. Airlines depend on fueling equipment to keep them flying, so any equipment downtime in remote areas can be catastrophic to local economies.

Swissport sold its cargo business at Copenhagen Airport to WFS The sale includes all business activities currently carried out by Swissport Cargo Services Denmark ApS as well as all assets. Most of the employees are expected to move to WFS Denmark A/S. In other news, the ground service provider won five-year for the three airports in Algeria: Constantine Mohamed Boudiaf; Batna Mostepha Ben Boulaid and Tlemcen Zenata Messali El Hadj. The deals will further strengthen Swissport's market position in Algeria and Africa along with its current operations in South Africa, Kenya, Tanzania, Morocco, Nigeria and Cameroon.

Iberia Airport Services will serve passengers and aircraft on Ethiopian Airline's three weekly flights between Addis Ababa and Madrid Airport. The African carrier thus become one of the 200-plus airlines served by Iberia's handling unit. In 2013 it served some 73 million passengers and 310,000 aircraft at 41 Spanish airports. In other news, the ground service provider submitted its bid to handle flights by third-party airline at the 22 Spanish airports with fewer than 1 million passengers annually. It will also soon bid for aircraft and passenger handling concessions at the country's 19 busiest airports.

SKYWAY Aviation Handling Company Limited, has been picked as the preferred ground handler for the Emirates Airlines. SAHCOL will provide ground handling services to the airlines' daily flight operation at Nnamdi Azikiwe International Airport, Abuja, Nigeria.

Alimentation Couche-Tard Inc., through its wholly-owned indirect subsidiary Statoil Fuel & Retail sold its aviation fuel business to Air BP. SFR Aviation supplies aviation fuel products

to airliners, general aviation, military and bulk customers in nine countries across Northern Europe.

JBT Aerotec won a contract worth more $11 million from a U.S.-based aviation ground services provider for the supply of Commander cargo loaders, Tempest aircraft deicing vehicles and Expediter towbarless tractors. The equipment will support the customer's business expansion at a major U.S. international airport. In other news, JBT Aerotech also won a $5 million to supply compressed air, airconditioning and electrical power carts designed to service the environmental control systems and avionics of fighter aircraft. Finally, JBT AeroTech has been awarded a contract exceeding $6 million to supply gate equipment for the Atlanta Hartsfield International Airport Concourse T Optimization project.

Aviramp will supply Norwich International Airport with its self-contained mobile passenger boarding system designed to provide access for all including passengers with reduced mobility. The airport becomes one of the first UK airports to the ramps.

Telford Design received a purchase order for one of its largest projects this year. The project is to manufacture and install 12 conveyor baggage systems for Wichita Airport, to be installed on twelve glass passenger loading bridges. In other news, the company will supply additional conveyor baggage systems to Savannah Hilton Head Airport. Finally, the company received an order for 13 systems at the Greenville Spartanburg Airport

Landmark Aviation completed the acquisition of Ross Aviation, a network of FBOs throughout the United States. Ross operates in major cities and resort destinations within the U.S., including Denver; Santa Fe; Miami; and six locations in Hawaii. The acquisition has increased the size of Landmark's network from 57 to 75 locations globally.

AAR's Nordisk Aviation Products has started delivery of 400 Nordisk AluLite AKE air cargo containers to Korean Air. Each containers weighs 65 kg and is the lightest-weight full-aluminium airfreight LD3 container in the industry.

Signature Flight Support, acquired the assets of FBO 2000 including its locations at V.C. Bird Antigua International Airport, R. Bradshaw International Airport in St. Kitts and Vance W. Amory International Airport in Nevis. This strategic acquisition adds three new locations to Signature's growing Caribbean network of locations including San Juan and St. Maarten.

Epic Aviation LLC was among 11 oil and gas distribution companies to be awarded multimillion-dollar contracts by the Pentagon's Defense Logistics Agency. Epic will be paid up to a maximum of $12,002,258 on a one-year contract to supply military aircraft with aviation turbine fuel. Epic supplies commercial, military and general aviation customers from almost 300 fueling points, from Anchorage to Horseshoe Bay Resort in Texas.

The UVair FBO Network

announced that it has expanded its presence in North America with the addition of three new member FBOs, bringing the total number of FBOs in the network to 25.The local chain has branded all three locations as UVair FBO Network members:

- Sacramento Executive Jet Center
- Sacramento Capitol Jet Center
- Sacramento Mather Jet Center

People

Justin Akinleye has joined Tronair as product development manager – JetPorter. Akinleye has more than 15 years of aircraft towing tractor experience on a global level. Most recently, Akinleye was with Eagle Tugs.

Dennis Suedkamp joined Malabar International as executive vice president, sales and marketing. Suedkamp has more than 30 years of experience in sales, marketing, and general management in the domestic and international aviation industry.

Anthony Banome was promoted by Meridian Jet to director of fuel sales. In addition to his responsibilities for maintaining and growing volume of FBO fuel sales, Banome will also be charged with developing and executing the long-term fuel strategy for both the Meridian FBO and charter businesses. Banome began his career at Meridian in 2007 as a customer service rep.

John Riggir was appointed vice president and general manager of Jet Aviation Singapore. Riggir will assume leadership of the company's expanded maintenance and FBO facility at Singapore's Seletar Aerospace Park, including responsibility for the Hong Kong and Kuala Lumpur facilities.

Jeremy Stafford has been appointed chief executive officer of John Menzies plc, the global aviation services provider and print media distributor. Stafford will be John Menzies' first group chief executive for seven years. After Patrick Macdonald left in 2007, the company split its leadership between the heads of its distribution and aviation businesses. He brings experience of leading and growing large scale international contracting businesses and has a strong track record both operationally and strategically starting at British Airways and then built up over 16 years with BT, with Phoenix IT Group and Serco Plc. Most recently Jeremy was chief executive of Serco UK and Europe.

"We are delighted that Jeremy is joining the board as chief executive officer," Iain Napier, chairman of John Menzies plc, said in prepared remarks. "We are at an exciting stage of our development with strong growth opportunities and Jeremy, with his strategic vision and extensive experience of operational management and contracting in a business to business environment, is the ideal person to lead us forward."

ADVANCEMENTS IN GREEN GSE

Nothing new in GSE? We beg to differ. Here are a few new developments that promise to take the industry down a greener path.

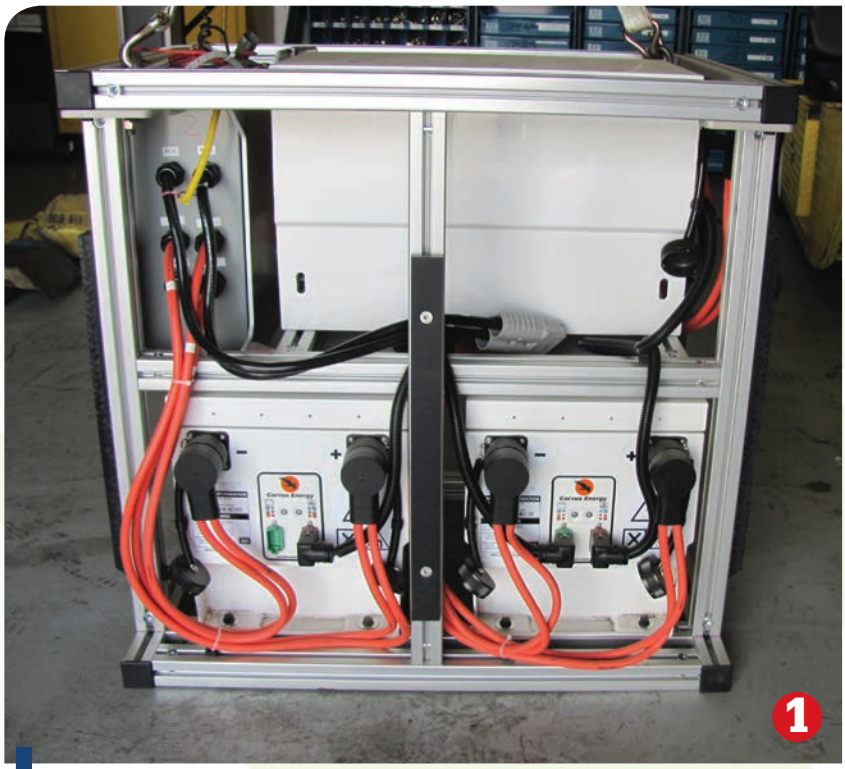
By Steve Smith

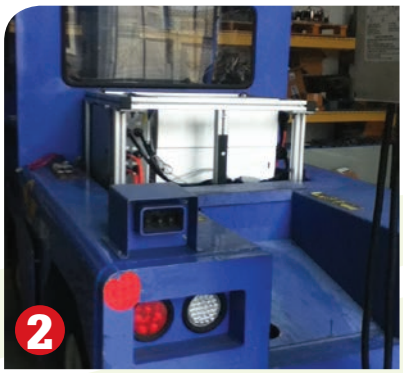
We've heard the old chestnut that there's nothing new within the GSE world more often than not. The truth is there is always something new to discuss about the future of GSE product development. Here are just a few of the advancements we've heard about recently, all with a particularly energy-efficient theme:

LITHIUM

Last year, the Idaho National Laboratory, a U.S. Department of Energy research operation, pitted lithium batteries against the commonly used flooded lead-acid batteries used throughout the GSE industry.

"Validation testing previously had not been performed within fleet operations





***1.** The Corvus lithium battery pack, with a specially designed container for the tractors. **2.** A tractor integrated with the battery pack. **3.** The Corvus battery integrated into a tractor with additional ballast weight for the six-month test.*

to determine if the performance of current advanced batteries is sufficient to withstand the duty cycle of electric baggage tractors," according to the report's introductory remarks.

A rigorous day-to-day GSE vehicle performance test was set up with Southwest Airlines' ramp operations at Ontario International Airport. The lab used four of the airline's baggage tractors with the help of John Salter, reliability analyst for GSE with Southwest and Tony DiLuccia, lead GSE technician for operations at ONT.

"No alterations to the fleet operations were made for the baggage tractors under test in order to allow for comparison with other GSE fleets," the report says.

Corvus Energy Limited was chosen to supply the lithium-based battery packs used for the test. Corvus created a prototype battery pack configured with three battery modules in parallel with a junction box and vehicle control unit. Each module contained 24 series-connected cells in order to allow for a similar voltage range as currently used within the baggage tractors. The three modules and junction box were placed in a structure that was specifically designed to fit the battery cavity of an airport baggage tractor.

Two the tractors had the Corvus batteries while the other relied on flooded lead-acid batteries.

Minute-by-minute logs of battery usage information were collected for each battery over the duration of the demonstration to gain a better understanding of how the different battery chemistries handle the duty cycle of a ground support baggage tractor. To accomplish this, the BIM needed to have a means for monitoring, recording, and communicating to the data server. It was determined that the desired information to be communicated was cell voltages, pack voltage, pack current, and pack temperature. For the FLA battery packs, this meant that the BIM hardware would contain the proper circuitry and software to monitor and record:

- 20 high-voltage leads placed on the positive terminal of every other cell of a 40-cell, 80-volt nominal pack in order to record intermediate cell voltages and full battery pack voltage.
- Pack charge and discharge current via a bus bar, connecting two battery cells and acting as a shunt.
- Battery temperature with a thermistor placed on the pack.

For the Corvus battery packs, each module was sealed without a means to connect the BIM analog circuitry to the modules. However, the Corvus BMS internal to each module communicated analog data for maximum and minimum cell voltages, module voltage, module current, module temperature, and module state-of-charge via the BMS CAN bus. Because the BIM also had to be connected to the Corvus CAN bus for charging, all analog data were taken from each module's BMS using a secondary CAN bus on the BIM.

Since the Corvus lithium battery pack weighed in at 500 pounds, about 2,700 pounds less than the flooded acid battery, the weight difference was addressed with the addition of ballast and steel plate. Over the course of six months, battery usage and charging data were collected from four eGSE baggage tractors.

The results proved positive for lithium.

"The lithium battery packs can accept a full charge current for the majority of a full charge, while the FLA battery packs can only accept full charge current for approximately the first hour of a full charge," the report says. "After the first hour, or in the case of an opportunity charge, the charge current for the FLA battery drops in order to maintain a charge voltage limitation."

The report also pointed out that the lithium batteries required less time for charging, resulting in less charge events. The lithium batteries were able to be charged more rapidly, with essentially an equal capacity added during the charge.

As for on-the-ramp performance, the evaluation showed the lithium batteries had a more consistent discharge to charge capacity efficiency at 85 percent and 86.7 percent, compared to the FLA batteries at 60.6 percent and 87.2 percent.

"When comparing the amount of time spent driving the baggage tractors versus charging," the report says, "there is a clear advantage to the lithium battery vehicles, with more time available for driving than required for charging. The FLA battery vehicles remained inefficient, with the vehicles undergoing more hours of charging than they could be driven due to the longer charges and battery equalization cycles required for the FLA batteries."

The findings were good news for Gian Carlo, general manager of GTA Aviation, when we saw him earlier this year at our AviationPros LIVE trade show in Las Vegas.

"I believe this report provides a very credible source for supporting our product," he says. "It takes some of the theory out of the use of lithium to power GSE and gives us a practical way to market the long-life practicality of the lithium batteries.

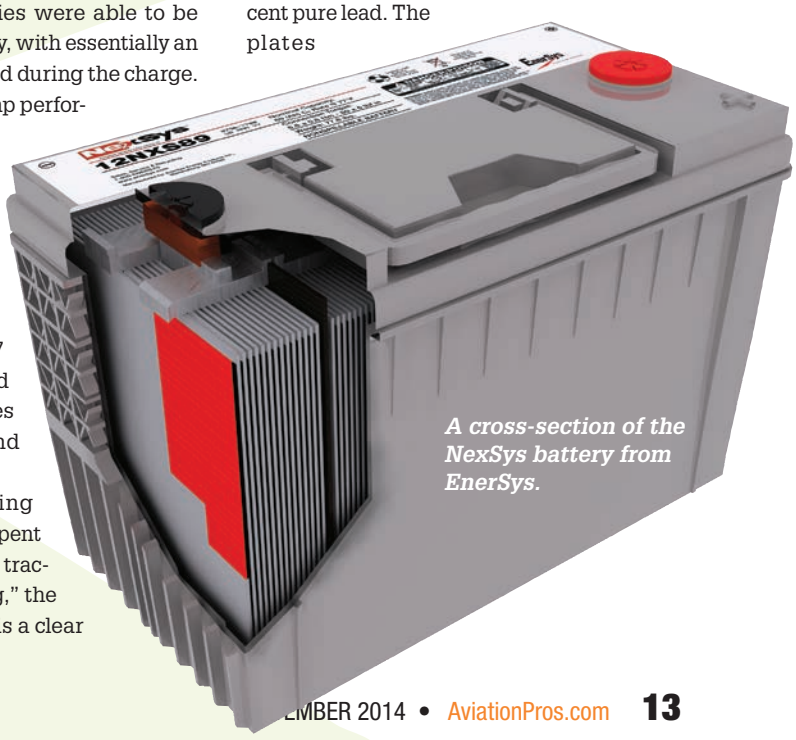
LEAD-ACID BATTERIES

We recently heard from Todd Allen, president of Allen Energy, about the new battery that a couple of airlines are currently testing on their equipment.

"We have a new battery out there called thin plate pure lead," he told us."They have the benefits of lithium at a lead acid price."

While they may be new to the GSE market, the NexSys battery and charger system manufactured by EnerSys has been used in other industries.

According to product information, the batteries are constructed from 99 percent pure lead. The plates



A cross-section of the NexSys battery from EnerSys.

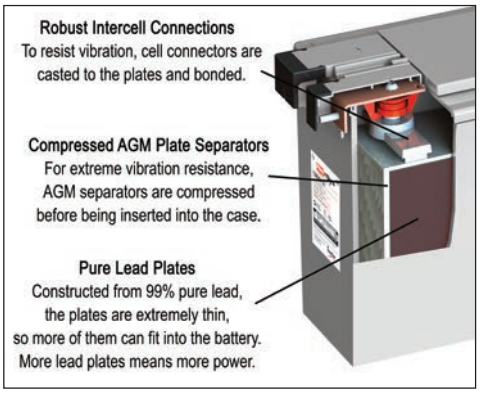
are extremely thin so more of them can fit into the battery.

"More plates means more power," Allen adds.

Also, the batteries feature compressed Absorbed Glass Mat separator with high electrolyte absorption and stability to enhance cyclic capability. To resist vibration and eliminate internal sparking, cell connectors are casted to the plates and bonded.

Taken together, Allen says NexSys batteries offer optimized cycling performance and rapid recharging that conventional lead acid batteries – gel or flooded – cannot match. When used with an approved charger, the batteries offer the following benefits:

- High energy throughput – up to 180 percent of C per 24 hours with an opportunity charging regime.
- Long maintenance-free life cycle – up to 1,200 cycles at 60 percent DOD.
- Short recharge times – less than three hours at 60 percent DOD.
- More power in less space – the batteries typically take up a third less space than the equivalent lead calcium batteries.



PRECONDITIONED AIR

Meanwhile, outside a gate at Sarasota-Bradenton International Airport, a new more environmentally friendly PCA unit is being put to test with great results, according to Rick Hansen, president of the aptly named Verde GSE.

"We didn't want to rush this product to market since we wanted to put it in a real-life environment and what we've heard from the airport has been very positive."

Hansen recently started the company along with three other partners, including an engineer he had worked with during his career at Hobart Ground Power Systems.

"We set out to build a different type of business to build a different type of unit," he adds. "We've incorporated the best of the refrigerant technologies from the automotive, food equipment, and aerospace industries to build a simple, low cost, yet technologically advanced PCA system.

Hansen adds that the company's design principles are centered on four green principles:

- use of renewable materials,
- energy efficient products,
- quiet system operation,
- and ultra-low charge units and safer refrigerants.

Hansen put a PCA unit running at 30-ton mode at Sarasota last summer and when we spoke to him, he was making plans to test a 60-ton unit at Orlando International Airport by September.

Verde GSE is currently testing its PCA unit at two airports in Florida.

"Having the units at these airports has helped us understand the customer requirements better," Hansen told us, "and we have used the feedback to make some nice improvements."

At Sarasota, the Verde unit was matched up with a competitor's unit and were instrumented by the airport to service an MD-80 aircraft.

"What they discovered is the competitor's unit was pulling 85 amps, and our unit was pulling 55 amps," he adds. "Our unit was 35 percent more energy efficient. In addition our unit had 100 feet of hose between the unit and the aircraft and the competitor's unit 60 feet. So even though our unit had 40 more feet of hose, it was able to produce 10 degrees cooler air in the forward section of the aircraft and 6 degrees cooler air in the rear of the aircraft. We are very happy with these results."

Accordingly, Hansen says the company will start actively marketing the PCA unit by October.

FUEL CELLS

Last June, Plug Power Inc. publicly demonstrated its Plug Power GSE fuel cell prototype this week, for the first time.

The demonstration involved a Charlatte cargo tractor, which pulled 40,000 pounds of heavy weight that was spread equally on four dollies. This demonstration took place at Plug Power's premises and the audience included Charlatte America, FedEx Express (the GSE operator and project partner) along with the executives of Plug Power and also the representatives from the Department of Energy.

We first wrote about this development in our December 2011/January 2012 issue ("Fueling GSE With Fuel Cells.") At the time, Plug Power was the recipient of a $2.5 million, three-year grant from the Department of Energy to retrofit 15 Charlatte CTGE cargo tractors with its brand of hydrogen-powered fuel cells.

The company's newly engineered and designed hydrogen fuel cell beta unit promises to be a zero-emission power source for GSE, including auxiliary power units, tractors and belt loaders.

Revamped Charger

Minit Charger LLC announces the total redesign of its outdoor-rated fast charger. The design and functionality of the charger was reevaluated and the resulting design should improve reliability and maintainability while reducing the overall cost of the charger.

"Through historical data we have determined that our charger was over-powered for most industry applications," says Tom Wix, a longtime GSE veteran who reps the line.

The new Minit Charger model will be a 22kW dual port charger with dedicated 11kW to each port and includes output cable breakaway technology.

"The charger currently uses a battery interface device like other fast chargers to manage the charge process to meet manufacture specifications," he adds. "But by the end of this year the charger will be available with wireless communication between the charger and the battery using CellTrac battery management technology. "

This will allow the Minit Charger to operate side by side with chargers that use a hard-wired battery monitoring interface device to communicate with the charger.

The advantage is the CellTrac web-based battery management system will give users total visibility to their battery fleet as well as charger performance data from any computer with Internet access. With the CellTrac technology, alerts can be setup to send notifications when predetermined parameters (high/low voltage, low electrolyte, etc.) are crossed or as faults occur with the charger.

"This technology will let you proactively manage your electric GSE, increase battery life, and address potential issues before they become costly repairs," Wix adds.

The CellTrac technology can also be integrated into the AssetPro suite of asset management products.

Plug Power is trying to penetrate into the markets which are adjacent to the material handling business, where its GenDrive fuel cells have already proven their worth.

The demonstration involved a Charlatte cargo tractor powered by a Plug Power GSE fuel cell prototype, which pulled 40,000 pounds of heavy weight that was spread equally on four dollies.

The company plans in the next phase of the project to deliver 15 Plug Power GSE fuel cells to FedEx at Memphis Airport by the fourth quarter of 2014.

In conjunction with the GSE fuel cells, Plug Power will provide a GenFuel hydrogen infrastructure that includes:

- Scalable hydrogen supply that can ramp up from fueling 15 demo units to fueling an entire fleet of commercial units, without additional investment.
- Low cost liquid hydrogen that offers accelerated fuel savings as the number of GSE tugs in operation increases.

Big Hopes For Small Aircraft In China

General aviation starts to attract attention as an enabler of economic growth.

By Graham Norris

In 1935, Li Xiaqing became China's first qualified Chinese pilot, graduating from the prestigious Boeing School of Aeronautics. She had been inspired by her experience at the Paris Airshow, but had to fight a long battle when she returned to China with her U.S. credentials to earn her Chinese pilot's license. Those engaged in China's general aviation industry might feel they share Li's frustration when they look at the current situation here, but they are nevertheless seeing progress and remain optimistic about the future.

General aviation, which is a catch-all phrase referring to everything that isn't commercial airlines, freight or military, is still very much in its nascent stages in China, and a cautious attitude within the government means the sector will remain tiny compared to countries such as the US for some time to come. Getting reliable historical data about the Chinese general aviation industry is difficult, but according to the General Aviation Manufacturers Association, there were around 3,400 general aviation aircraft by the end of last year, compared with around 220,000 in the US. In fact, the US had more general aviation aircraft in 1929, shortly after Charles Lindbergh made his historic trans-Atlantic flight, than China does today. But from a low base, there is ample room for growth, with the number of business jets, for example, growing 40 percent in 2012 from the year before.

DIVERSE CUSTOMERS

Private aircraft operated by individuals and corporate flight departments, chartered on-demand commercial operations, air tourism, civil helicopter aerial work, and disaster relief and medical emergency transportation all fall into the category of general aviation. Because of the broad definition, companies in the sector cater to a wide range of customers with various business models and requirements. For example, Gulfstream, the No. 1 supplier of business jets to China, supplies the majority of its aircraft to companies for corporate use or leasing, with the remainder going to individuals. Users of these jets are seeking flexibility and range when realizing Gulfstream's concept of "office in the sky."

The biggest customer for Cessna, on the other hand, is the nation's aviation regulator, the Civil Aviation Administration of China (CAAC), for use in flight training, testing or mapping. And of the roughly 300 helicopters in China, most are used for activities such as patrolling power lines and providing emergency services.

One activity not allowed under the current Chinese regulations, and one of the most popular in the United States, is flying for fun. But given the restrictions overshadowing general aviation as a whole, the problems facing recreational fliers seem insignificant.

MAIN OBSTACLES

Pretty much everyone involved in general aviation agrees that the No. 1 bottleneck restricting growth is the limited amount of available airspace. The military controls the skies, and allows civil aviation to use around 20 percent of it. The result is that all aircraft, large and small, need to stick to tight corridors that crisscross the country between airports. The impact on punctuality for commercial airlines in China is well-known, but for general aviation the harm is even greater, as private aircraft are often at the back of the queue when it comes to take-off slots. Moreover, general aviation suffers from particularly tight control over airspace below 1,000 meters, which is where helicopters and smaller planes tend to operate.

"If they could open the airspace, that would do more than anything else to open up the industry," said Edward Smith, senior vice president, International & Environmental Affairs for GAMA. "That's not going to happen quickly."

Smith says that a close second behind airspace restrictions is the regulatory system, which often treats general aviation in the same way as commercial aviation. It is virtually impossible for an individual to operate their own aircraft, forcing them to use operator companies for whom complying with the certification regulations makes sense only because of the size of their operations. For example, in many countries, mechanics for general aviation aircraft need only a general license not tied to specific types of aircraft. In China, however, the rules for general aviation and commercial airlines are the same: mechanics need to be certified for each specific type of plane they will be

通用航空

(Tōngyòng hángkōng)

(General aviation)

working on. The result is high operating costs.

"China is one of the most expensive places in the world to operate a general aviation aircraft," Chris Jackson, director of project development at Genesis Aviation Development. "A friend of mine in the U.S. was amazed when I told him that a flight that cost him around $12,000 would cost the equivalent of $60,000 in China. It costs $10,000 just to fly into a major airport in China."

And that's if you can find a suitable airport to land at in the first place. The lack of infrastructure suitable of general aviation is the kind of chicken-and-egg problem that many see as a problem only the government can solve. According to the CAAC, China had 286 airports and landing in 2011, compared with 15,000 in the US. The airports that do exist often don't have the kind of small-scale facilities that general aviation needs, such as suitable fuel, maintenance and parking facilities. There is a lack of charts suitable for low-flying aircraft, or even certification specific to operating them.

Finally, actually buying the aircraft can be difficult, a problem that Gulfstream Asia Pacific President Leda Chong is acutely aware of. "The purchasing process is quite lengthy compared to the U.S., with import approval and validation taking up to a year to complete," Chong said. There are also significant import taxes and a valued added tax rate much higher than that for commercial aircraft. "But overall it's an evolving process—10 years ago it might have been impossible to even buy a jet."

UNIQUE CHALLENGES

For those used to the US system of general aviation management, the situation in China can seem counter-productive, yet they also acknowledge the unique challenges.

While general aviation in the United States has to a large degree supported the development of the commercial aviation industry, in China, the priority has been to develop commercial aviation as an enabler for economic development. Even so, Smith believes China has been missing a trick in failing to develop a general aviation sector. He believes general aviation can be a contributor to economic development in its own right, for example by integrating distant regions. It also complements the development of commercial aviation, for example by encouraging the development of the next generation of aviators.

He also emphasizes the experience in the United States of general aviation meeting the needs of all stakeholders, no matter they are security, safety or commercial.

"Last month we hosted a delegation of Chinese regulators, and we wanted to show them what's possible," Smith says. "So we took them to a general aviation airport five miles from Washington Dulles International Airport, which is the area's major airport. So not only is this pretty busy airspace, but, being near Washington, there are also more security restrictions than other places. But despite all this, it's still possible to very successfully operate general aviation out of this small airport."

MAKING PROGRESS

And that message of what's possible seems to be having a noticeable impact. Not only are rules and regulations slowly loosening, but many in the industry praised Chinese regulators for taking an open-minded attitude to the industry, despite the numerous competing interests of China's internal stakeholders.

"At the start, China said 'don't even talk to us about general aviation yet,'" says Paul Fiduccia, director of the sales program management at Cirrus Aircraft Company and co-chair of the General Aviation and Business Aviation Committee in AmCham China's Aviation Cooperation Program (ACP). "But in 2007, CAAC came back to the ACP and said that as the situation with airlines was under control, they were now ready to consider general aviation."

The result was a research project prepared by ACP that addressed basic questions about general aviation, such as the possible economic benefits, the ex-

perience of other countries and a possible road map for China. This was followed by another report focusing on safety and operations.

Then in the 12th Five-Year Plan, the Chinese government formalized its commitment to develop a substantial general aviation sector capable of making major contributions to economic and social development in China.

It included improvements in airspace and airport access, better general aviation airports, flight service stations for flight planning support, more maintenance services and jet fuel delivery facilities for general, and improved air traffic control procedures. This was followed in July 2012 by the "State Council Opinions on Promoting Civil Aviation Development," which set several key development targets for the industry. These included a transport growth rate of 12.2 percent for 2011-2020, an improved accident rate, general aviation growth of 19 percent, and increased access to air services for more of the population.

On the ground, more liberal regulators have started to unlock the value of general aviation. Whereas a few years ago it would take a week to get approval for a particular flight, it now takes less than 24 hours. While the same approval may take only a few seconds in the US, this is still a significant improvement in an industry where convenience and flexibility are the key selling points.

There are now also more possibilities for low-altitude aviation, with routes opening up around the country. Since January 2012, airspace below 1,000 meters in northeast, central and south China, as well as Tangshan, Qingdao, Hangzhou, Ningbo, Kunming and Xi'an, as well as areas of northeastern, central and southern China, have been experimenting with pilot schemes for the opening up of low-altitude airspace.

TOO CAUTIOUS?

One criticism leveled at the Chinese government is that it is overly cautious in its attitude toward aviation overall and general aviation in particular. In the 1990s, China's commercial airlines had one of the worst safety records in the world as it tried to play catch-up in the industry. It almost lost the right to fly to the United States, and in fact the ACP was created in part to help the country develop the inspection and oversight infrastructure needed to operate world-standard airlines. Chinese airlines are now among the safest in the world, but the cost has been in terms of lost economic and social benefits, as well as a blame culture that discourages any re balancing among these objectives.

Nevertheless, industry observers such as Fiduccia are understanding of the government's attitude.

"How cautious is too cautious?" he says. "The culture in the United States is that an individual can make choices and government doesn't protect you from everything. The FAA has over 100 years of experience in making thousands of regulatory choices in striking a balance between safety versus economics and social benefits, and it is most toward the economics side. When FAA comes up with a rule, they need to come up with an economic impact analysis.

"In China, however, it's a very young industry, with pilots and air traffic controllers lacking experience. So this is the correct way to do it because everyone's green. As pilots, mechanics and controllers get more experience, the balance should shift more to economic and social benefits."

This article was first published in ***Business Now****, the magazine of the American Chamber of Commerce in China (www.amchamchina.org).*

About the author:

Graham Norris is the communications director at AmCham China.

The Challenges Of Detecting Composite Damage

Composite materials are becoming increasingly important in aircraft manufacturing and raise concerns in the ground support community since recognizing damage can be difficult to detect.

By Mario Pierbon

Earlier in the year at the Farnborough International Air show aviation enthusiasts had the opportunity to see showcased for the first time the Airbus 350 which a few weeks before had taken off from Toulouse on its maiden flight and is due to go in service by the end of the year with Qatar Airways.

One of the peculiarities of the A350 is that more than half of it is made out of composite materials. The same holds true for the other large airplane of its generation, the Boeing 787. By contrast, earlier Boeing and Airbus aircraft are approximately 10 to 15 percent built of composite materials in terms of their total structural weights. The A380 – launched in the early 2000s as the first aircraft made of lightweight material – is approximately 20 to 25 percent made of composites.

RAISING CONCERNS

The fact that composite materials are becoming increasingly important in aircraft manufacturing raises some concerns in the ground support community because of specific 'behavioral' properties of these materials when impacted by ground support equipment.

In September 2011, the U.S. Government Accountability Office released a report on the "status of the FAA's actions to oversee the safety of composite airplanes" (GAO-11- 849 Aviation Safety). The report highlighted the challenges in detecting and characterizing damage in composite structures, as well as making adequate composite repairs.

Most notably, the report also said the impact damage to composite structures is unique in that it may not be visible or may be barely visible, making it more difficult to detect than damage to metallic structures. As a result, safety occurrences may result as a consequence that the defects of composite material surfaces can be missed during daily

Three years ago, the U.S. Government Accountability Office released a report on the safety of composite airplanes. The report highlighted the challenges in detecting and characterizing damage in composite structures, as well as making adequate composite repairs.

and weekly checks. A simple 'tap' test might not detect delaminations at early stages or in specific areas.

Most aviation personnel – including ground crews – are capable of identifying a dent or a tear in a metallic structure, and reporting it as suspect damage. However, after a heavy impact, a composite structure could appear undamaged if no surface marks or flaws are present. And where they are present, they may go unreported due to having a similar appearance to small dents on a metallic structure, which ground crews may be inclined not to report, states Lawrence Cook in "Visual Inspection Reliability For Composite Aircraft Structures."

There is concern that ground crews, as well as maintenance technicians and pilots, may be less experienced at recognizing impact damage on a composite aircraft structure. This could lead to a situation where damage is not reported and is, subsequently, not repaired. In addition, the reliability of detecting surface flaws in composite structures is not well-established, which further means that significant damage may not be reported, according to Cook.

DETECTION RECOMMENDATIONS

What can be done from an operational point of view to facilitate composite damage detection on the ramp especially in the years to come when more and more composite built aircraft will enter into service?

The European Aviation Safety Agency commissioned a research project entitled "Composite Damage Metrics and Inspection" which was issued in 2012 and authored by consultants Zoltan Mikulik and Peter Haase. The report contains three recommendations providing useful guidance in the operational aircraft ground handling environment.

- **Preventing impact:** The first operational recommendation is to improve on preventing undue impact.

"A contact between ground service vehicles and the fuselage is mainly protected by passive safety devices (such as rubber bumpers)," reads the report. "Although modern ground service vehicles feature several types of electronic safety systems like proximity sensors and automatic position adjustment, there are no safety regulations that would require these systems to be fitted in vehicles involved in aircraft ground operations. Standardization of the safety systems is necessary to reduce the impact threat."

- **Monitoring systems:** A related recommendation deals with improved performance monitoring of GSE operations.

"Ground service vehicles, which repeatedly make contact with the fuse-

Aircraft Safe Docking

Particularly compliant with the first two European Aviation Safety Agency recommendations mentioned above is a technology called "Aircraft Safe Docking" (ASD) developed by GSE manufacturer, The TLD Group.

The ASD system relies on a 3D infrared camera installed on the ground support equipment. While approaching the aircraft, the GSE operator will reduce the speed and engage the ASD system. This operation will limit the speed of the machine to 5 km/h and a flashing beacon will indicate to the ramp management that the safe mode is activated.

As soon as the ASD detects an obstacle, the system will ask the operator to reduce the vehicle's speed to 0.7 km/h via a light and a buzzard; if the driver does not react, the system will stop the machine automatically. The operator will then only be allowed to approach the aircraft with a speed limited to 0.7 km/h in a perfectly safe condition and finish the docking process.

"The system does not require electronics to act on behalf of the operator, drastically reducing the risk associated to potential failure," states Laurent Decoux, technical director of The TLD Group.

With regard to 3D infrared camera technology, as compared to traditional radar technology, Decoux affirms that 3D infrared cameras rely on a single sensor with lower failure and are easier to retrofit and to adapt to existing solutions.

The 3D camera allows for a complete monitoring of the area, including the equipment itself (handrail position, boom extensions) and it is a better solution with regard to interferences and meteorological impacts.Decoux also says that traditional radar technology instead is very sensitive to meteorological conditions and, as a collision can occur from many different directions, a very large number (14 to 20) of radars/sensors will be required to ensure a safe area. This implies a higher risk of failure (leading to a potential aircraft impact), a higher cost of production (cabling) and a lower potential for retrofit.

In order for the risk of composite damage detection failure to be fully eliminated, the ASD system also includes a collision recorder. The collision recorder will stop the unit in case of impact and require management to come to the unit and restart it with a dedicated key. An optional diagnostic tool will allow the ramp manager to visualize the complete condition of the equipment during the impact, this will include speed, gearbox status, accelerator and brake pedals' position for further investigation.

"The collision recorder will not only avoid the aircraft to leave with unreported collision," Decoux adds, "but will also increase the operator's accountability since the collision recorder can be linked to the GSE fleet management system."

Most ground crews are capable of identifying a dent or a tear in a metallic structure, and reporting it as suspect damage. However, after a heavy impact, a composite structure could appear undamaged if no surface marks or flaws are present.

lage, such as mobile stairs and cargo loaders," reads the report, "might be fitted with monitoring and assistance systems that would provide better visibility and assessment of the vehicle's movement within a specified distance from the fuselage. Recording of sensor and camera data might support the complete reporting of incidents and their investigation."

- **Reporting damage:** A third recommendation concerns improving ground damage reporting.

"Based on the proven differences in detecting damages between metallic and composite fuselages, the reporting processes should cover every inadmissible contact to evaluate all potential safety risks," reads the report.

Although ground service personnel are trained to follow the "report every vehicle contact" policy, the EASA report also points that incident reporting typically relies strongly on visual examination of the outer skin structure, and states that the rate of vehicle contact reporting is approximately 50 percent.

"Due to a lack of visually evident damage," the report adds, "this rate can even further reduce for composite hulls if vehicles are not equipped with modern active safety systems."

TRAINING PERSONNEL

Training ramp personnel to locate key composite structures on specific aircraft is a very significant part to improving ground damage reporting. With metallic structures, the need of reporting a collision event is straightforward. A hit surface does or does not look damaged and, therefore, is or is not damaged,

But there's much more complexity when reporting when a composite surface is hit. In such circumstances, there is a need to report that a structure is hit irrespective of whether ramp personnel

Training ramp personnel to locate key composite structures on specific aircraft is a very significant part to improving ground damage reporting. With metallic structures, the need to report a collision is straightforward, but there's much more complexity when a composite surface is hit.

believe it is damaged or not.

It should be kept in mind that the time lapse from the collision event to the actual reporting of the accident may also significantly affect detectability of damage.

"Some damaged structures may relax, e.g. impact damage, to the extent that 60 percent or more, of the original profile may be recovered," reports the UK CAA Civil Aviation Publication 562 "Civil Aircraft Airworthiness Information and Procedures."

After the reporting of a collision event, the suspected damaged surface needs to be inspected to assess whether there is or isn't sub-surface damage.

NDT

Aviation Safety and Quality Consultancy GEDA of Italy provides guidance on the various techniques available for non-destructive testing (NDT) of composite surfaces.

"Due to the anisotropic nature of composites, whose characteristics depend on the direction along which they are considered, the identification of damage requires NDT techniques to be carried out by qualified personnel according to EN4179 standard (under EASA) or in accordance with MIL-STD-410 (under the FAA)," affirms GEDA.

These techniques are based on different methodologies.

One methodology is **optical**. As such it implies the visual observation of a component, possibly with the use of a lens. Advanced methods include the reflection of a light wave, holographic techniques and interferometry.

Another methodology is based on the use of **penetrating liquids**. This implies that an inspection can locate open surface discontinuities and "take advantage of the ability of some liquids to penetrate by capillarity in the cavities or emerging cracks," reports the GEDA.

If the composite is electrically conductive, another applicable technique is based on the use of eddy currents.

"A sub-surface control is made with a probe where an alternating current passes through, and it produces eddy currents by electromagnetic induction," says the GEDA. "This technique allows detecting the presence of defects located below the outer surface of the component under inspection."

Additional NDT methodologies available include radiography, thermography and acoustic techniques.

Through radiography it is possible to have a detection of defects, voids, or the presence of foreign materials up to tens of centimeters in depth. On the actual radiography the irregularities are presented with a different density than the material that surrounds them.

Through thermography, thermal imaging with infrared thermo-cameras detect the temperature of the bodies analyzed. Defects correspond to changes in temperature. "Thermography is aimed to the analysis of thermo-elastic stresses, for improvements in the design of components, and it views and measures the voltages in components under stress, thereby identifying a possible initiation of cracks," reports the GEDA.

Through acoustic techniques the defects which are present in the material - for example, cracks and/or debonding - are detected by means of ultrasonic signals generated by a suitable probe or by means of acoustic signals generated manually by the operator, according to the GEDA.

With acoustic methods, there exists a particular instrument called a ramp damage checker, which is available from Olympus and is a hand-held ultrasonic instrument designed for preliminary screening of aircraft composites to identify areas of possible subsurface impact damage, but not to substitute for comprehensive testing by a trained inspector.

"Ultrasonic sound waves travel through materials in a predictable way," reports Olympus. "When a high frequency sound pulse generated by an ultrasonic transducer is coupled into a piece of solid laminate composite, it will travel through the material until it encounters an air boundary, at which point it will reflect back as an echo that can be detected by a gauge.

In the case of structurally solid composite, that reflection will come from the back wall or the inside surface of the laminate. If, however, there is a delamination or subsurface cracking parallel to the surface, then the reflection will come instead from the damaged area and arrive earlier in time.

"The difference in the echo patterns from good versus damaged material can be used to identify areas of internal damage that are not visible from the surface," reports Olympus.

The ramp damage checker is not intended to scan large areas, and is used to screen areas of suspected damage.

The device must first be calibrated for the specific thickness of material that is to be tested and, as such, it must always be re-calibrated whenever switching to an area of different thickness or different material. The device features a back-lit LCD that displays the word GOOD if no subsurface damage is found or the word BAD when it detects subsurface damage. Any BAD indication should be investigated further.

An additional internal "safety barrier" complements the device: the gauge displays BEYOND CAL THICKNESS when only a strong back wall echo is received, but it is beyond the calibration window.

About the author:

Mario Pierobon holds a Master's Degree in Air Transport Management from City University London and works in business development and project support at Great Circle Services in Lucerne, Switzerland. Mario regularly writes about aviation safety and his main professional and research interests are in the areas of airside safety.

What You Should Know About Types of Learners and Training Delivery Methods

Be able to identify which particular training delivery method will prove most effective for your employee or group of employees

By DeborahAnn Cavalcante

It is well documented that a company's most valuable asset is its people. Many companies' employment hiring practices make use of psychological testing to ensure the folks they hire are inherently talented for the roles they play. This is truly a great practice, but what about the folks who have been long-term employees and served in various roles within the company?

Consider this: any time an employee is given a new role, or department change it should be considered a "New Hire" situation from the perspective of orientation and familiarization with the expected policies and procedures for that new role and associated responsibility. For any employee new to their position, the next step is to train to company and department policies, procedures, and expectations. How do we do this, and even more importantly, do all learners learn by the same delivery method?

There are different types of learners who respond in various ways to particular training delivery methods. As a supervisor, you should become familiar with the characteristics of different types of learners, so you will be able to identify which particular training delivery method will prove most effective for your employee or group of employees. Doesn't it make sense that a group of sales managers may not learn in the same way that a group of IT engineers might, and it would be different still for a group of A&P aircraft mechanics.

Classroom training can be an affordable easy way to train several staff members at the same time. But you need to consider carefully how the benefits of classroom training will mesh with the needs and learning styles of your staff. To do this, ask a cross-section of your trainees these questions.

- Do you prefer to interact with others while learning?
- Do you learn best by doing?
- Do you require a distraction-free learning environment?
- Do you need to be held accountable for your learning?
- Do you work best in a structured environment?
- Do you prefer to have immediate answers to questions and an opportunity to talk about training content?

If your sampling of trainees answered yes to most or all of these questions, classroom training may be the best method for your organization. All that remains is to find the most effective training classes.

On the job training

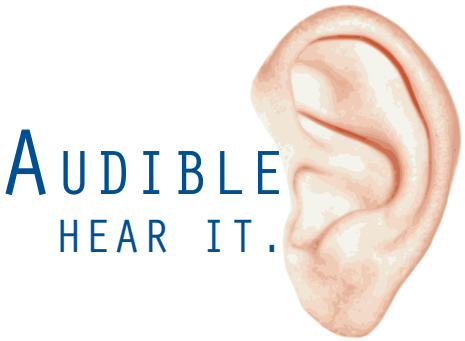
On the job training or OJT, is where an employee is instructed at the actual place of work, while he or she is doing the actual job for which they are being trained. A designated training supervisor usually performs the "hands-on" training or sometimes an experienced employee serves as the instructor. OJT provides a unique opportunity for participants who already possess some job-related skills and the knowledge to see how the tasks are to be performed at their new place of employment. The student should have a basic knowledge of the task or have prior experience in performing the task to which they are to be trained. Any training should be briefed before it begins to prepare the student and ensure an understanding of exactly what is intended to take place and any safety concerns. Personal safety and safety of other personnel, equipment, and property needs to be discussed. This is commonly termed a "tailgate safety briefing."

Online training

Online training, sometimes referred to as virtual education, allows educational and technical information to be transferred separate from time, location, or space requirements. Online is a way to reduce travel costs and time in attendance at training meetings away from the facility. It provides flexibility as learning can be accomplished at each individual's own pace and time frame.

Different types of learners

Every person is different, and every person learns in a different way. The way one person learns may not be the way everyone learns. There are basically three different types of learners: the audible learner, the visual learner, and the kinesthetic learner.



THIRTY PERCENT OF LEARNERS ARE AUDIBLE LEARNERS and prefer to hear things. Your ears are your best sense, and seem to be connected directly with your brain, feeding it everything you hear. If a trainee is an audible learner, they are probably good at foreign languages, learn best in study groups, and read slowly. They may find it difficult to keep quiet for long periods of time, and tend to enjoy attention and interaction with others. The subjects audible learners find most difficult are ones that include lengthy reading assignments and having to write answers about that reading assignment. They may also find spelling hard, since they prefer to spell according to how their ear hears the word. They will remember things the easiest if they can hear them; they also will benefit greatly from group discussions.

VISUAL LEARNERS are those who learn things best through seeing them, on average 60 percent of the population are visual learners. Visual learning trainees like to keep an eye on the instructor and may prefer sitting in the front of the class and watching the lecture closely. Often, visual learners will find that a picture or a chart is very helpful in understanding explanations. The characteristics of a visual learner include:

- Individuals, who are good at spelling, but forget names.

- Trainees that need quiet study time alone.
- Some have to think awhile before understanding an example.
- They sometimes doodle and draw and dream in color.
- Understand and like pictures, charts, and drawings. They would also typically be good at sign language.

ALSO KNOWN AS TACTILE LEARNING, KINESTHETIC LEARNING is a learning style which learning takes place by the student carrying out a physical activity, rather than listening to a lecture or watching a demonstration. People with a kinesthetic learning style are also commonly known as "do-ers." Tactile-kinesthetic learners make up only about 5 percent of the population. Kinesthetic learners typically learn best by doing. They are naturally good at physical activities like sports and outdoor activities. They enjoy learning through hands-on methods and typically like how-to guides and action-adventure stories. They might pace while on the phone or take breaks from studying to get up and move around. Some kinesthetic learners seem fidgety, and have a hard time sitting still in a class. Key methods for instructing kinesthetic learners include:

- Go out and perform tasks after they have been given basic knowledge
- Use task simulations or role play
- Involve physical activity in training
- Vary classroom and physical activity

All trainees need motivation to eagerly engage in training. To make your training program successful and develop employees who become valuable assets, find ways to have employees see the bigger picture, and how they can realize their own potential and enhance their career. Lastly, develop good communication and problem-solving skills. Solicit nonjudgmental feedback and consider it a gift, whether positive or negative. It will prove invaluable in the continual improvement of both your training program and ability to identify the type learners you will be training, as well as how to best deliver what they need.

About the author:

Deborah Ann Cavalcante leads Diversified Aviation Consulting (DAC) and along with her associates has firsthand experience in air carrier operations, private charter aircraft, general aviation operations, military/civilian interface, FBO management, maintenance repair station training, safety training, human factors training, and customer service training. For more information on DAC visit www.dac.aero.

Underground GSE

A few squares in the ground can hold more service points than any boarding bridge can, including fuel, all types of power such as 120V, 480V, 400HZ, PC Air, plus shop air, potable water, LAV fill and dump and more.

By Bryan Bullerdick

My love for ground support equipment started from a dislike of ground support equipment. I started my aviation career as an airline pilot. I did most of my flying on the East Coast with quick turn operations.

I loved the flying. What I didn't care much for was maintenance delays, and the worst kind would be damage caused by GSE. While inoperative APUs, auto breaks, and reverser buckets would slow us down, a fuel truck, baggage tractor or LAV truck hitting the fuselage will take the aircraft off line for days.

I could tell you stories for days about GSE damage to aircraft I witnessed, but one sticks with me. I was called to pick up a MD 80 grounded in Miami and ferry it unpressurized to Pittsburgh to get fixed.

When I arrived in Miami I grabbed the ferry permit and weather and proceeded to preflight the aircraft. I came across a softball-sized hole in the skin of the aircraft. The local maintenance crew

After a few years supplying these underground systems, simply and primitively called PITS, I realized what could happen after you stop calling them "a hole in the ground with a lid" and started to see what it can do for your operations.

met me before I was done and told me the aircraft was hit by a piece of GSE servicing the aircraft that morning and they went on to say they were going to tape the hole with speed tape. I looked around at the adjacent gates and saw a traffic jam of service equipment rushing around to turn the other aircraft. I could see very easily how this could happen.

Proceeding on, it hit me that the aircraft we are ferrying can't pressurize. This means we can't fly very high. In fact not only could we not fly above 18,000 feet, we had to fly the more zigzag lower altitude airways. So we take off and quickly accelerate to our max speed of 250 KTS.

I didn't mind the slower speed or even the huge waste of fuel flying so low. But all the doors and flight deck window seals without pressurization were whistling so loud, we had to yell to each other to hear. Four hours later we arrived in Pittsburgh. With a pretty good headache, I turned over the aircraft to the hangar maintenance crew. Before I made my way to the terminal to return home I asked one of the seasoned maintenance guys if this was something he'd seen often. To my surprise, he said this was not uncommon. He said people in a hurry - coupled with bad visibility, congestion and confusion - all seemed to be the reasons they kept his metal shop busy.

Events and days like this made is what made me dislike GSE, But it started to make me more aware of cities that handled their aircraft service more efficiently than others, which got me thinking about the GSE industry I eventually ended up in.

NEW CAREER

With thousands of my fellow pilots being furloughed and with aircraft parked on unused runways we looked for new careers. Initially I wanted to stay in aviation until my furlough callback. But a year later, I started to feel more at home in ground support. Thinking back to that ferry flight and with my line experience I started to think about how I could help the ramp congestion. At the same time I was looking at how to reduce ramp congestion while even more equipment requirements were being added like PC Air and 400HZ.

The first attempt was a design I called the External APU. I packaged any power supply and air supply that the APU on the aircraft would be supplying while parked at the gate into one single mobile unit. The idea was to combine a diesel GPU and a separate diesel PC Air unit into one all-in-one design.

I figured this would also limit the need for multiple towing tractors as well. This idea worked for open ramp areas and cut down the equipment by one piece. I then spent hundreds of hours looking at how to better integrate GSE on a passenger boarding bridge. Several good ideas were tried but the bridge market remained consistent to what they have done for decades such as hanging boxes, cables, baskets, remotes and pantographs all over the bridge. While functional, it is a mess in general. Cables and hoses still need to be stretched out to 60 feet or more.

After that, I started to get involved in military hangars. I got involved in one of the most advanced military hangars in the world at MCAS Yuma. I quickly learned that you could take a ton of service equipment, place it right where it needs to be and hide it.

A few 2 foot by 2 foot or 3 foot by 3 foot squares in the ground can hold more service points than even any passenger boarding bridge can. Fuel, all types of power like 120V, 480V, 400HZ, PC Air, shop air, potable water, LAV fill and dump and more. I was very excited to see this simple solution work so well. These underground gems finally sparked my interest to the fullest. I really started to think this is the magic that needs to be promoted.

EYE-OPENER

After a few years supplying these underground systems, simply and primitively called PITS, I realized what could happen after you stop calling them a hole in the ground with a lid and started to see what it can do for your operations. It starts to open eyes.

In the United States, this technology is mostly accepted today in the aviation industry for hangars applications and for airports fueling applications. Head east across the Atlantic and you can find all types of PITS being used everywhere.

The Middle East uses PITS on almost every new airport gate, ramp and hangar designs, and I can see so many good reasons for this.

Think back to my Miami story. A congested ramp with quick turns. And while safety is always No. 1, aircraft sitting at the gates are not generating revenue. There is a reason for a quick turn and that is to keep the aircraft usage maximized for profit.

Underground (GSE) Service Points or USP might make the industry think about what these holes in the ground can offer.

So what if in Miami not only the fuel was underground but the 400HZ, the PCA, the LAV service and the potable water was also underground? How many positive things does this do? The aircraft still needs all these services, but why does a truck have to delivery them within feet of the thin-skinned aircraft? PITS can be placed in the right locations so that hook ups are quick. These PITS can cut the traffic around the aircraft in half.

Underground (GSE) Service Points or USP might make the industry think about what these holes in the ground can offer. No matter what you call it or think about it, they are a very viable solution to reducing GSE equipment moving around aircraft and quite possibly, had this technology been around in Miami that day I would have never been flying an MD 80 costing the airline 10s of thousands in costs and lost revenue up the east coast that day.

About the author:

Bryan Bullerdick is president of B GSE Group, LLC and a former ATP commercial pilot.

The Three Keys To Getting the Best ROI On Your Next Dolly Fleet

Buyers should pay attention to versatility, durability and safety once they get past the basics of size and capacity.

By John Hoeper

Ask about your manufacturer's quality of equipment. A company that uses robotic welding machines and large-scale laser and plasma cutters can offer a product with consistent quality in everything it produces.

Wheels. Steel. Towbars. Dolly designs may seem relatively simple, but there's a lot more to the equipment — from where the rubber hits the tarmac to the many sizes and styles of platforms.

There are the basics, certainly — container sizes, various cargo capacities and facility workspaces. And then there are the highly individualized requirements and specifications for different companies. For this very reason, tarmacs globally are crowded with hundreds of distinct models of dollies.

To get the best return on investment while maintaining the safest worksite possible, buyers for an airline, air cargo business or other company need to be prepared. You should have a clear understanding of what takes a dolly beyond the basics and focus on the details — from vertical restraints to locks to towbars — to determine what will make your operation most efficient and what's simply overkill.

Start by evaluating key areas of daily operations, from worksite to usage. Those aspects will come into play when deciding between orientation, weight capacity, load sizes and key dolly features that could trim the fat and make the tarmac safer ground.

When focusing on dolly details, buyers also should aim to purchase products that will result in the highest ROI, paying special attention to three key elements: versatility, durability and safety.

VERSATILITY

Dolly capacities are all over the board. Each style can haul certain containers or combinations of containers. For example, some can only handle a single LD-2 container, while others can haul

multiple containers or pallets at a time. These dollies contain LD stops and vertical restraints throughout to firmly lock different sizes of containers in place.

The first step is to determine what sizes of containers or cargo pallets are typical, as well as the weight ranges. Then, look into what works best. Do you need vertical restraints? Do you haul a mix of pallets and containers? Do you work in an area better suited to side-tow or front-tow designs?

Some companies might need several types of dollies to accommodate different needs. A more economical approach is to select a versatile dolly that allows you to replace multiple dollies with various capacities with a single piece of equipment that can manage numerous styles of containers and pallets. The multifaceted dolly will be easier to use and will help boost worker efficiency, especially for airlines or cargo companies that require switching between cargo and containers.

Other dolly components further impact the unit's versatility. For example, each dolly incorporates either rollers or casters, and the choice between the two comes down to operational needs. For instance, if a company can only perform side load transfers, rollers might be best because it's easier to move heavy loads over rollers. Further, since the rollers are larger and more durable, they are less likely than casters to be damaged by those loads. Relatively speaking, roller beds generally require less maintenance, as well. But one drawback of rollers is the limitation of movement. Once a container is on the dolly, it is limited to simply forward and backward motion.

From an operational standpoint, it's usually easier for employees to work with caster beds. Casters are multidirectional, so operators can rotate the container in any direction once it is loaded. This flexibility allows for easier and faster loading and unloading.

Further, some manufacturers offer inverted casters. These are more resilient and less likely to break or become damaged under the constant movement of heavy loads. With caster protection, only about a half inch of the caster extends beyond the plane of the dolly's frame, rather than the entire caster

Be careful to only work with companies that have optimized the industrial design of its equipment. Ask about the company's engineering and manufacturing processes.

Additionally, ensure the dolly manufacturer employs American Welding Society certified welders, who have the additional training and skills needed to guarantee better welds and durable construction.

being exposed. When exposure is minimized, these parts are apt to last longer and require fewer repairs and less maintenance.

Aside from realizing greater efficiency with a more versatile dolly, purchasing departments should place significant weight on the dolly's construction and durability, and in more ways than one.

DURABILITY

Keeping only the highest quality equipment on the tarmac is the best way to reduce liability, prevent aircraft strikes and eliminate havoc. The same holds true for long-term ROI; pinching pennies might not be the best approach to finding that lasting product that will lower costs over the long haul. Rather, evaluate the features each unit offers that will increase long-term ROI. As you do so, keep in mind that a well-built unit is one that is strategically engineered, put through rigorous testing and doesn't have any breakaway parts.

Start with the parts and components. Examine casters and rollers to determine whether the quality can withstand frequent loading, heavy loads and changing loads. Check out the rims and tires. Customers looking for the longest-lasting option, rather than just the one with the lowest initial cost, should request solid rubber tires. With no valve stems or tubes, the worry of getting a flat is completely eliminated. Conveniently, they also are less expensive, even though they are more durable than pneumatic tires.

Pay special attention to the towbar, as well, ensuring it is integrated into the frame and manufactured with heavy-duty materials. As with any piece that comes into contact with other equipment, the towbar should be strongly engineered with durable materials to prevent potential incidents. Further, ask questions about the towbar operation. The best manufacturers use dual springs to prevent the towbar from hitting the ground when it is dropped. This not only prevents injury, but also extends the life of the towbar.

Check out the hardware, too. What grade is it? Grade 2 hardware, although common in the industry, will not stand the test of time, and frankly, should be unacceptable in this safety-focused industry. Look for equipment with a solid, heavy-duty steel frame with Grade 5 zinc hardware throughout to prevent failures in the field. As a point of reference, compare Grade 2 to Grade 5. Grade 2 is formed with low or medium carbon steel and has a minimum tensile strength of 74,000 pounds per square inch. Grade 5 hardware is formed of medium carbon steel and features a minimum tensile strength of 120,000 psi — 46,000 psi more than Grade 2.

Zinc-plated components also will help prevent corrosion that's inevitable with lower-quality metals when they are exposed to the elements 24/7. In addition to zinc-plated hardware, many companies prefer powder-coated equipment as an additional line of defense against equipment fading, scratching and chipping. Powder coating not only makes equipment look better longer, but it's corrosion resistance also helps equipment last longer. Some manufacturers offer hot-dip galvanizing to further protect a dolly from corrosion.

Next, consider how the piece of equipment is manufactured. Is the production of dollies a small portion of a

varied business, or does the company specialize in manufacturing ground support equipment? A manufacturer with a ground support equipment focus will understand the unique rigors, safety requirements, and liability issues that come with equipment operating on busy tarmacs where collisions with expensive equipment are just one of many possible concerns.

Additionally, ensure the dolly manufacturer employs American Welding Society certified welders, who have the additional training and skills needed to guarantee better welds and durable construction.

Ask questions about the company's testing processes. Some manufacturers hook up strain gauges and test equipment on washboard tracks to ensure product designs are durable, long lasting and reliable. Some also have dedicated quality inspection personnel following carefully laid-out ISO procedures. ISO (International Organization for Standardization) certification ensures that nothing but the customer received only the highest quality equipment.

Check out a company's reputation, too. Word-of-mouth reviews and industry longevity provide key indicators of the type of product you'll get. Find a manufacturer with decades of experience. Better yet, find one whose early equipment is still in use daily. There's no better way to know if what you buy today will hold up.

Dollies can haul certain containers or combinations of containers. For example, some can only handle a single LD-2 container. The New Standard Dolly from WASP Inc. handles LD-2, LD-3, LD-4 and LD-11 containers, including two LD-2 or LD-3 containers at a time, to accommodate ever-changing workloads. It also takes on half, 88-by-125-inch (224-by-318-centimeter) and 96-by-125-inch (244-by-318-centimeter) pallets.

Powder-coated equipment is an additional line of defense against equipment fading, scratching and chipping. Powder coating not only makes equipment look better longer, but its corrosion resistance also helps equipment last longer.

Further, select a company that has optimized the industrial design of its equipment so it can be built with more stock steel sizes and components. These companies usually can manufacture faster and hold units in inventory for quick order fulfillment. Ask about their manufacturing processes, as well. Does the company use the best equipment, such as robotic welding machines and large-scale laser and plasma cutters, for consistent quality in everything it produces?

Beyond this, consider if the company's design alleviates shipping time and expenses for you. Some dollies are designed for ease of shipping and inexpensive transport. For example, stackable dollies, which can be stacked as many as five high and rolled onto a transport vehicle without crating, allow for fast, inexpensive shipping. And remember that any kind of crate-free shipping is a benefit, as cargo containers are expensive to rent. Roll-on and roll-off capabilities allow transport without those crates, plus it makes loading and unloading easy.

Finally, never elect to work with a company that isn't ISO-certified. This certification validates a company's processes to ensure they meet the most stringent quality standards. Along with these certifications and standards, manufacturers should be well versed in CE, SAE and OSHA guidelines, as well. Perhaps most importantly, the company needs to be willing and able to accommodate your company's safety department's unique requirements.

SAFETY

Most companies have stringent safety rules and guidelines that go above and beyond what's mandated. They know they're liable, and more importantly they care about their employees, so they adopt specific requirements to protect employees and others, as well as their reputations. These safety guidelines change from company to company; one size almost never fits all.

For example, some companies require manually engaged locking mechanisms on vertical restraints so that operators have a reminder of a task they need to perform. Others prefer spring-activated locking mechanisms to avoid an operator needing to remember to engage the mechanism.

It's common also now for airlines to require extensive equipment manuals including operating manuals, training manuals, and train the trainer documentation, in specialized formats. This is exactly why it's so important to find a manufacturer that offers customization and is able to quickly deliver on special requests.

Despite the wide range of specialized dollies in the market today, one thing holds steadfast, strong and true — selecting a dolly with versatility, durability and safety, all custom tailored to your requirements, will pay for itself in many ways for years to come.

About the author:

John Hoeper is the vice president of engineering for WASP Inc. He has more than 27 years of experience in GSE design and manufacturing.

Fire-Resistant Cargo Containers

AAR Corp.

AAR announced a new Nordisk ULD design, which during testing was proven to contain a fire for up to six hours. Partnering with DuPont, AAR was able to replace traditional construction with innovative materials for a unit that is lighter than any similar product on the market.

AviationPros.com/company/11135441

NOVA Baggage Lift

U.S. Applied Mechanics Inc.

The NBL is a bridge-mounted vertical conveyor for moving heavy loads up to 500 pounds to and from the passenger boarding bridge. It quickly handles overflow baggage situations and allows motorized wheelchairs to be raised or lowered within 15 seconds. Approved for installation by major PBB manufacturers.

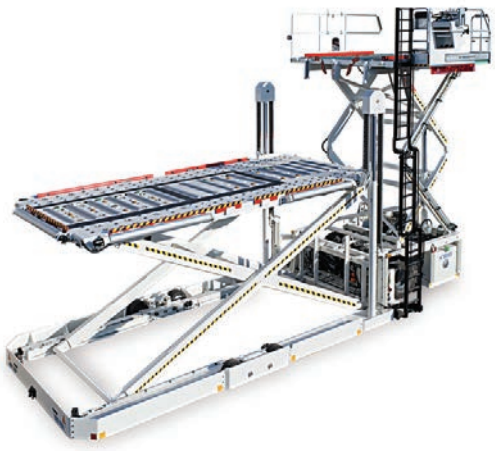
AviationPros.com/company/10726163

Commander HD

Colson Caster Corporation

The Commander HD is designed for superior performance in some of the most abusive applications and environments where high-load requirements and impact resistance are a must. The wheels are machined, not injection-molded, which provides superior resilience and impact strength. The wheel features a slightly crowned tread profile, rolls easily and provides better floor protection than other high capacity wheels, such as steel, iron or phenolic.

AviationPros.com/company/10921735



SCHOPF LoadStar 140

SCHOPF Maschinenbau GmbH

SCHOPF has added the LoadStar 140, a 14-ton main deck loader, to its successful cargo loader product line. This loader provides main deck and lower lobe container loading capability for a wide range of aircraft. It is equipped with a multi-directional ULD transfer system and proven SPS controls for convenience and less components. The SCHOPF LoadStar 140 saves loading and offloading time, due to latest and well-proven components. It handles all pallets and ULDs up to a weight of 14 tonnes and a length of 20 feet.

AviationPros.com/company/10759498

660 Belt Loader

TUG Technologies Corporation

With the heaviest chassis in its class, the TUG 660 belt loader assures years of dependable service in the most demanding ramp applications. The central mounted conveyor is elevated at both ends by lift arms that are activated by single-stage, double-acting cylinders.

AviationPros.com/company/10025876

Container Trailer

Accessair Systems Inc.

Accessair's TTAS Automatic-Stop Turntable Container Trailer with its proven 360-degree rotating turntable has proven to be the most in-demand model produced by its MOODY Products Division. In addition Accessair produces a variety of container trailers, pallet dollies, racks, slave pallets and baggage and cargo carts for the global market.

AviationPros.com/company/10026206

Aircraft Cargo Loaders

Trepel Airport Equipment GmbH

Trepel Airport Equipment designs and manufactures a complete range of commercial aircraft cargo loaders, with lift capacities from 3.5 tons up to 30 tons. Trepel loaders benefit from a simple, yet rugged and reliable design, with low maintenance and repair costs providing attractive long-term life cycle costs for your cargo handling operations.

AviationPros.com/company/10024634

Baggage Carts

Par-Kan Company

Par-Kan Company offers both open and covered baggage carts.

- 4,000-pound Capacity
- 5,000-pound Capacity
- 8,000-pound Capacity
- 5th Wheel Steering
- Towbar Activated Braking System
- Pneumatic or Solid Tire Options Available
- Fixed or Torsion Axles Options Available
- Curtains and Tarp Systems Available
- Knock Down Cart Options Available for Sea Container Shipments
- Powdercoat Finish

AviationPros.com/company/10025701

Power Stow Rollertrack System

Power Stow A/S

Power Stow's Rollertrack System is a versatile belt loader extension that allows for one-man bulk loading of narrow body aircraft holds. This system offers our customers the opportunity to save money on aircraft fuel by removing heavy onboard loading systems or to control manpower cost by eliminating the need for a two-man, belly-loading operation. Power Stow's Rollertrack System can be attached to most major brand belt loaders.

AviationPros.com/company/10300843

Stack@Ease

Vanderlande Industries, Inc.

STACK@EASE will double the performance of handlers making up flights (any type cart and/or containers) without impacting the way of working. By making any baggage item weightless for the handlers it takes away any restriction for lifting. By introducing NO restrictions within the freedom of movement, the current natural, intuitive and parabolic ways of working remains intact.

AviationPros.com/company/11245390

Casters

Ground Support Products Corp.

Ground Support Products offers a variety of casters: No. 8729: OEM, forged steel, pressed steel with sealed base bearing, toe guard (winged) and stair casters. No. 8729: Sealed double-ball race wheel bearings prevent dirt and debris from obstructing movement of caster wheel. No. 8729: GSPs 3.5-mm fork is 1/2 mm thicker than most others. No. 8729: Designed specifically for the roughness of the airline industry.

AviationPros.com/company/10025514

Commander Cargo Loaders

JBT AeroTech, Jetway Systems

JBT AeroTech offers a range of cargo loaders capable of servicing lower and main deck cargo. All Commander use the HeliRoll conveys system, which has revolutionized aircraft container and pallet handling. A PLC-based electrical system and swing out power model provide quick access for maintenance servicing. JBTs cargo loaders are available in a wide variety of sizes and configurations and have load ranges of 8,000 to 60,000 pounds.

AviationPros.com/company/10024639

Inverted Caster Bed

Wasp Inc.

Wasp Inc. has an inverted caster bed dolly with many design features making it the leader in the industry. The main frame uses high tensile materials to both lighten the dolly and make it much more durable. Tubing reinforcement tie in to the frame for added strength, caster protection, fork tine ways, and stops for virtually all pallets and containers.

AviationPros.com/company/10820360

Baggage Chute

Page Industries

PAGE Industries presents the most modern and easy to install Baggage Chute available. PAGE introduces the P6000 Baggage Chute utilizing up-to-date manufacturing techniques which produce a lightweight and maintenance-free modern solution that is safe and convenient to use. No baggage chute is easier and quicker to install to help minimize costs.

AviationPros.com/company/11201217

AviationPros.com/company/10017532

GSE Casters

RWM Casters

RWM Casters manufactures heavy-duty industrial casters custom designed and produced in the USA for the aerospace and GSE industries. From ultra high capacity dual wheel casters for the heaviest applications, to pneumatic and shock absorbing casters for a cushioned ride across the tarmac, RWM has a solution.

AviationPros.com/company/10756667

Container/Pallet Loader

TLD

TLD offers three main container and pallet loaders: Model 838 with 16,500-pound capacity; Model 929 with 33,000-pound and 44,000-pound capacity and the Model 121 with 66,000-pound capacity. Operators and maintenance personnel can appreciate the speed, ease-of-operation and industry-leading diagnostics on all TLD loaders.

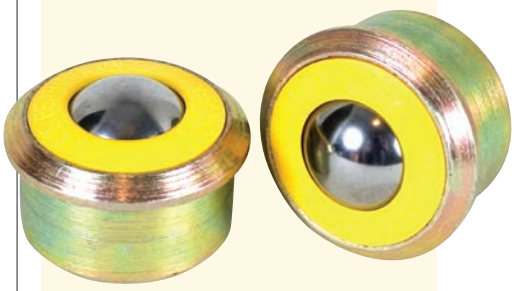
AviationPros.com/company/10025391

Conveyor Belting

HBD/Thermoid Inc.

Thermoid® PACK-EZ S/Weave conveyor belting is approved and preferred by all major, package handling companies. Especially suited for slider bed systems, these belts are built to resist abrasion, stretching and fire.

AviationPros.com/company/11191802



Ball Transfer Units

B&T Bearing Inc.

B&T Bearing Inc. provides ball transfer units, pop-up stops, and conveyor rollers to the air cargo industry. Our ball transfers come in either a plated carbon steel housing or an all stainless housing. All of our units use stainless steel balls. We also provide a multihole unit, which was developed and has been approved for military applications.

AviationPros.com/company/10317587

Bag Lift

Austral Star LLC

The Austral Star Bag Lift solves the problem of gate checked baggage handling with a solution that starts at concourse level by having passengers place their bag onto a bag cart built into the walls of a passenger boarding bridge walkway. The ramp agent then closes the door and sends the cart to the ramp where workers wheel it to the aircraft for loading. Reduce aircraft gate time and increase safety by eliminating bag congestion in the PBB, says the company.

AviationPros.com/company/10709548

Baggage Cart Curtains

ABC Industries Inc.

ABC Industries, Inc. has expanded its GSE product offering with a new line of baggage cart curtains. Available for baggage, freight, mail and catering, the cart curtains are custom designed to each cart OEM's specification. A series of carabiner hooks are used to quickly attach and detach the curtain, eliminating time consuming and costly maintenance. The curtains are constructed of high-strength, 20-ounce ABC VentaTex® PVC fabric.

AviationPros.com/company/10732974

Cargo Handling BTUs

Air Spares Inc.

Ball transfer units provided by Air Spares have been in use for many years under their original name Transact International. These units are designed to support heavy loads over typical ball deck units. Individual load carrying capability of each BTU is 500 pounds. The design and development of these BTUs has evolved over many years beginning with Transact International and continues with Air Spares, Inc. responding to industry demands.

AviationPros.com/company/10176942

Hybrid Tractor

Harlan Global Manufacturing LLC

Harlan Global Manufacturing presents its cutting edge hybrid tractor. The Harlan Hybrid HTH is manufactured with modular components. This means the diesel engine can easily be replaced with LPG, CNG, fuel cell or any other emerging technology.

AviationPros.com/company/10026177

Five Power Options

NMC-Wollard Inc.

NMC-Wollard Model TC-888 Belt Loader is available with electric, gas, diesel, LP, and dual fuel power (each with automatic transmission). All power types are emission-compliant, except diesel, which conforms to the TPEM (or FLEX) program. The TC-888 baggage conveyor features a unitized, tubular, impact-deflecting chassis. Modular engine/transmission power pack makes maintenance and repair simple.

AviationPros.com/company/11076581

Conveyor Baggage System

R.J. Design LLC

Conveyor Baggage Transport System was designed to making handling baggage safer for ground support persons by eliminating back and shoulder injuries and keeping the ramps from having additional equipment under PBB.

AviationPros.com/company/11192247

PRODUCT HANGAR

Covered Pallet Trailer

Clyde Machines Inc.

The 15F2862 15,000-pound capacity trailer has a new recessed frame to protect customer markings. This Covered Pallet Trailer will hold LD1, 2, 3, 4, 7, and 8 containers, or 88-inch x 125-inch, 96-inch x 125-inch, and 88-inch x 108-inch pallets. With its actuated towbar, self-adjusting rear brakes and 4 x 8, three-stage solid tires, this durable trailer is a Clyde featured product with a quality powder coat finish.

AviationPros.com/company/10779066

Shipping Containers

Stanley Supply & Services, Home of Jensen Tools Inc.

Jensen Tools avails SKB's Roto-X series cases that are designed to provide maximum protection in shipping environments. Rugged cases are rotationally molded for enhanced durability. Unique exterior design allows for stacking and efficient transport and storage. Recessed, heavy-duty twist latches accommodate a padlock, and spring-loaded handles are recessed for added protection. Cases are available with or without foam lining.

AviationPros.com/company/10024839

CBL2000E

Charlatte of America

AC powered 80V full-size electric belt loader with 25 foot conveyor. Direct Drive belt system with flush-mounted weather-proof controls. Majority of components compatible with T137 tractor.

AviationPros.com/company/10027110

Two-Way Multi-Load Pallet

KieTek International Inc.

KieTek International, Inc presents its new XPS82 Two-way Multi-Load Slave Pallets. The pallets feature:

- Galvanized plank.
- 15K capacity.
- 8-in. centers and interlocks.
- Permanent non-slip surface.

AviationPros.com/company/10024637

Valet Cart

Premier Engineering and Manufacturing

Premier Engineering and Manufacturing Inc., has recently introduced a new line of non-powered luggage carriers. Perfect for the commuter/FBO ground handling departments, the VC 600 is capable of transporting up to 600 lbs of cargo or carry on baggage. The all stainless steel construction assures years of corrosion free use. The near perfect balance and 12" pneumatic tires affords even the petite ramp service staff effortless maneuverability. Passengers will also appreciate the convenient dual umbrellas storage pockets for the less than perfect travel days. Finally, ergonomic design and application will ultimately reduce the repetitive motion injuries often associated with baggage handling. Units are currently in stock and available at Premier's always reasonable price.

AviationPros.com/company/10025315

Ball Transfer Units

Alwayse Engineering Limited

Alwayse Engineering has further developed the quietness of its new 807 Air Cargo Ball Transfer. This unit has received acceptance from a number of international companies. They are also pleased to announce that they have been honored again with The Queen's Awards for Enterprise — International Trade 2008.

AviationPros.com/company/10025177

Steve Smith

'Go East Not West, Young Man'

Because all roads lead to, er, China.

By Steve Smith

We're in danger of mixing metaphors with our headline and deck since the original versions of each were 1) a familiar rally cry concerning America's expansion westward in the 19th century, and 2) a medieval sentiment about taking different paths to reach the same place.

I know enough about my trade to know that's not what we should be doing, but we think our modern adaptations are fitting to describe the aviation industry's very bright future in China.

China hopes to build 56 new airports, relocate 16 airports, and renovate/expand 91 airports by next year. That will mean China should have 220 airports, including three national hubs, five regional hubs, and 24 medium hubs.

COMMERCIAL AVIATION

For the commercial airline industry, Boeing just released a report that predicted China's demand for passenger planes will be 6,026 airplanes over the next 20 years.

Chinese airlines with large global networks continue to look for opportunities to expand as international flying increases from secondary cities apart from Beijing, Shanghai and Guangzhou. According to the company's research, this growth in the long-haul segment is expected to result in demand for an additional 1,480 new fuel-efficient widebodies, such as the 777, 787 Dreamliner and 747-8 Intercontinental. This year's forecast reflects a continued shift in demand from very large airplanes to efficient new small and medium widebody airplanes.

While that certainly sounds promising, just days after Boeing released its annual China Current Market Outlook research, a trade group announced that Boeing's forecast had it all wrong. No, said the International Bureau of Aviation's Beijing office, Boeing's estimates are far *too low*.

GENERAL AVIATION

And if the commercial market is looking up, up, up, just take a look at the country's general aviation market. Talk about getting in on the ground floor. Right now, estimates are that there are only 400 corporate jets in the whole country – less than, as a consultant pointed out in a recent issue of *The Economist* magazine, the number found at the Orange County Airport.

As this month's International feature on page 17 points out, the Chinese government, long an obstacle to the growth of general aviation, has a new attitude toward this segment of the market.

The latest official five-year plan explicitly promotes the development of non-airline aviation, as well as the allocation of air space for such flights. (To give you an idea of the situation now, corporate jets, for example, only get two take-off slots an hour at Beijing's main airport.)

The reforms will make all the difference to the general aviation market. China's military, in particular, have given up air space and handed over a dozen military airfields for general aviation.

It's all too easy to find research on China's plans for airports and its demand for aircraft. It's not as easy to find projections on the ground support equipment all that new real estate and brand-new aircraft will require.

However, there's no doubt that these large increases in the number of airports and aircraft will require all sorts of GSE and present significant business opportunities for manufacturers inside and outside of China.

KEEP CALM AND DOWNLOAD GSP APP

GSP
ground service provider

Get Your Exclusive Content-
Download the FREE GSP App Now!

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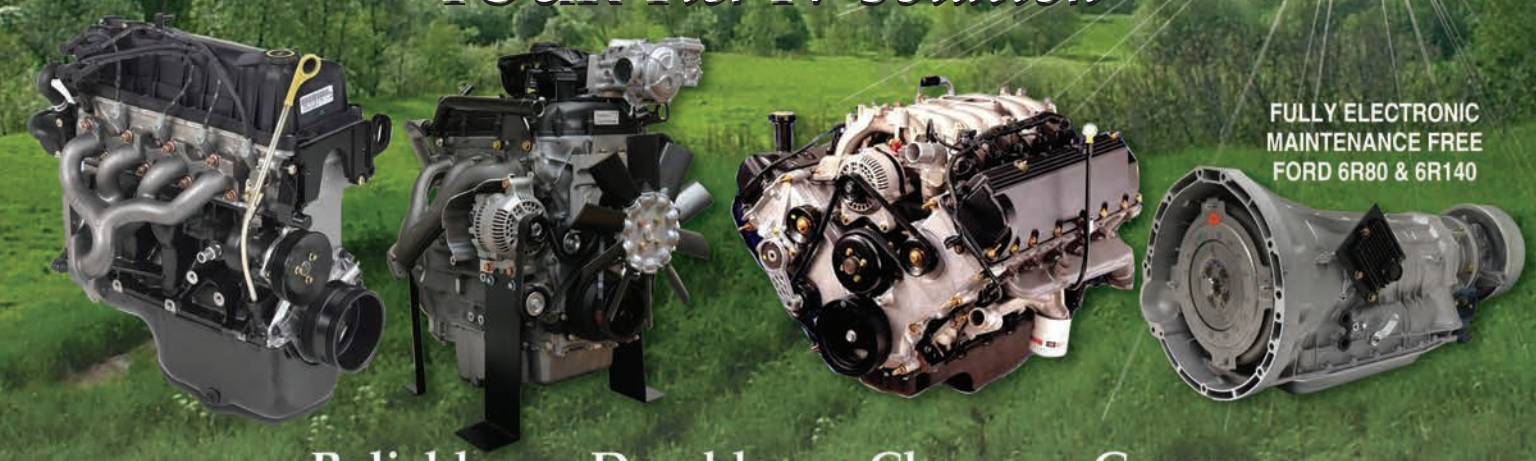

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