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# **GROUND SUPPORT WORLDWIDE**

**2015 LIFETIME ACHIEVEMENT**

**JERRY  
EBERLE**



**JUNE/JULY 2015**

## **INTERNATIONAL**

### **China's Airport Growth Plan**

With a wave of new airport construction, what does it mean for GSE manufacturers and suppliers? Page 12

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**Subscription Policy:** Subscriptions are free to qualified businesses. Others may purchase subscriptions at these rates: US, 1-year \$45, 2-years \$85; Canada & Mexico, 1-year \$65, 2-years \$120; All other countries, via airmail, 1-year \$95, w-years \$180. Single copies \$10.

**Ground Support Worldwide** (USP 015-386, ISSN 1934-2861 print, ISSN 2150-4016 online) is published ten times annually in February, March, April, May, June/July, August, September, October, November and December/January. Periodicals postage paid at Fort Atkinson, WI and additional mailing offices.

Change of address or subscription information: Toll Free – 877-382-9187, Local – 847-559-7598, circ.groundsupportw@omeda.com

POSTMASTER: Please send address changes to *Ground Support Worldwide*, Cygnus Business Media, PO Box 3257, Northbrook, IL 60065-3257. Printed in the U.S.A.

Canada Post: PM40612608. Return undeliverable Canadian addresses to: *Ground Support Worldwide*, PO Box 25542, London, ON N6C 6B2. Canadian GST #R42773848.



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Oshkosh, WI



**inter airport Europe**  
Munich, Germany



**NBAA Business Aviation  
Conference & Exposition**  
Las Vegas, NV

## Business Buzz

Construction work to expand **AI Maktoum International** at Dubai World Central (DWC) is expected to start later this year. The capacity of passenger terminal will increase to 26 million annually by 2017 from present level of 6 million only as Dubai International nears its capacity limit due to the rapid growth of passenger traffic.

**Continental Commercial Specialty Tires (CST)** is expanding its comprehensive solid tire portfolio. The

Continental CS20 is now available in 6.00-9, 7.00-12, and 7.00-15 variants. The tire is ideal for use on tow tractors, especially within airports.

**Hong Kong Air Cargo Terminals Limited (Hactl)** — Hong Kong's largest cargo handler — has received the Transport and Logis-

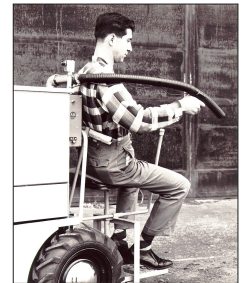
tics — Silver Award, in the 2014 Hong Kong Awards for Environmental Excellence (HKAEE).

**Iberia Airport Services'** handling division has just renewed its contract to serve Switzerland's Helvetic Airways, which flies from Zurich and Berne to the Spanish islands of Gran

Canaria, Majorca and Minorca, with a total of some 200 flights per year. Iberia's handling unit serves more than 200 airline customers, and in the past year has signed new contracts and renewed contracts with Lufthansa and Aer Lingus.

**Menzies Aviation** announced that its Bobba

**LEKTRO** kicked off its 70<sup>th</sup> anniversary in business at the NBAA Maintenance Managers Conference with a dinner cruise on the Willamette River in Portland, Ore. This year marks a milestone for the electric aircraft tug manufacturer, who recently took its global leadership of the industry to a new level with its 4,500th tug sold earlier this year. In 1945, Wilt Paulson founded Willamette Aircraft and Engine Company in Beaverton,



Ore., to repurpose military aircraft for crop dusting and other civilian uses. Moving his company to Warrenton, Ore., to be closer to family in 1948 his business quickly morphed into the electric vehicle company now known as LEKTRO.

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Bangalore team received the Star Performance Award for Outstanding Handling Service during 2014. The team at Bangalore worked on the DHL operations.

### Middle East Airlines

opened its new \$25 million cargo center that was designed to speed up the inspection of goods and handle all types and sizes of imported and exported items. The new cargo center can store 165,000 tons of goods, compared to the old facility's 65,000-ton capacity. The cargo center is built over an area of 20,645 square meters and is equipped with more than 330 closed-circuit cameras, four large scanners, four generators and the latest UPS systems.

**Van Nuys Airport (VNY)** announces the successful launch of U.S. Customs and Border Protection (CBP) services for arriving international flights. A dedicated 1,528-square-foot clearance facility is housed at Signature Flight Support.

## New Deals

Fiji Airways, Fiji's national airline appointed **Aero-Care Flight Support** as its new ground handling company across its New Zealand operations. This includes operations related to ramp and customer services, aircraft cleaning and baggage claim in Auckland, Christchurch and the Fijian carrier's soon-to-be launched Wellington ser-

vices. Aero-Care will begin handling Fiji Airways flights from Wellington from the outset (June 25), and take over Auckland and Christchurch operations from September 1.

### HABCO Industries

announces a five-year agreement as an authorized repair and overhaul supplier for specific Honeywell Ground Support Equipment (GSE). Within the agreement, Honeywell has licensed proprietary technical information to support the calibration, test and repair of its GSE.

**JLG Industries Inc.**, an Oshkosh Corporation company and a leading global manufacturer of aerial work platforms and telescopic material handlers, acquired Power Towers Ltd., a leading low level access equipment manufacturer based in Leicester, UK. Power Towers currently offers seven lift models, both self-propelled and push around, that are rated for indoor and, in some cases, outdoor use.

Sanjiv Edward, head of Cargo Business at Delhi International Airport has been named as the next Chairman of **TIACA**, with Sebastiaan Scholte, CEO of Jan de Rijk Logistics named Vice Chairman.

**Vanderlande** has confirmed that it recently has secured orders of more than €200 million – which makes the total order intake €1 billion for the 2015 financial year – for its integrated

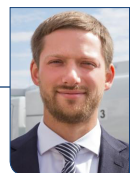
solutions in the baggage handling and parcel and postal sectors. Changi Airport Group (CAG) has selected Vanderlande as the baggage handling supplier for the Terminal 1 Redevelopment project at Singapore Changi Airport. Vanderlande's STACK@EASE will be installed in the Terminal 3 Integrated Baggage facility at London Heathrow Airport, forming an integral part of one of the world's most complex and technologically advanced baggage handling systems. And it has confirmed an operations and maintenance contract for the existing terminal at Al Maktoum International DWC in Dubai.

**WASP Inc.** purchased FAST Manufacturing Inc., a producer of high-quality sprayers and liquid fertilizer equipment for the agricultural industry. The merger will increase WASP's manufacturing capacity by 50 percent in terms of space, machinery and employees, according to Dane Anderson, president and CEO of WASP Inc.

Douglas, Boeing, Certified Aviation Services, and Tracor Aviation.

Barfield and AMG strengthen their sales synergies with the first step combining their two sales organizations. **John Rogers** has been promoted to the position of senior vice president of sales for the new Barfield-AMG sales organization.

BGS, an international ground handling and aircraft fuelling services provider, named **G. Gumuliauskas** chief executive officer at the company and has already started to lead its operations in Lithuania.



VAS Aero Services, a global leader in aviation logistics and aftermarket services, reported aviation industry executive **William Kircher** has been named chief executive officer of the Florida-based company. Joining VAS from Pratt & Whitney, Kircher was most recently the vice president of Singapore Overhaul & Repair at P&W, as well as the president of UTC Aerospace Singapore.

## People



**Kenneth N. Channel** joins Malabar International as its new Director of US Sales

and Service. He has over 30 years' experience in the aircraft maintenance business. Prior to joining Malabar, he held maintenance management positions with Continental Airlines, McDonnell

A man wearing a yellow hard hat with 'PAGE' and 'KNOX' on it, sunglasses, a blue jacket, and a high-visibility yellow and orange safety vest stands in an airport tarmac. He is looking towards the camera. In the background, there are airport ground support equipment, including a white truck with 'www.oxfordats.com' on it, and a yellow aircraft service vehicle. The ground has red and white painted lines.

# 2015 GROUND SUPPORT LIFETIME ACHIEVEMENT AWARD: Jerry Eberle, PAGE Industries

*This year's Ground Support Lifetime Achievement Award goes to Gerald (Jerry) Eberle, the co-founder of Vacaville, Calif.-based PAGE Industries, who after 39 years in the GSE industry, retired in January.*

*By Sharon Spielman*

**J**erry Eberle's definition of retirement may differ somewhat from Webster's. "Retirement for me means reducing my work load while feeling confident that PAGE is in good hands," he says. "I will keep on designing and developing concepts while traveling and relaxing."

Spending more time with his wife Beth is crucial for them both. "Since Beth is technical, she understands that thinking about new things can be more relaxing than trying to figure out how to 'retire.'" "

Spoken like a man who truly loves his work, it is no wonder that Eberle accepted his lifetime achievement award on March 10 at the annual trade show, GSE Expo Worldwide in Las Vegas. The award, which is part of the Ground Support Leader of the Year Awards, is presented "to the person who has demonstrated commitment to the industry through numerous years of dedicated service."

## Humble Beginnings

When America was celebrating its Bicentennial, Eberle and his partner, Paul Aea, launched a business making avionics test equipment for avionics repair shops and military avionics manufacturers. The business was a logical fit for Eberle, who had both a pilot license and an FAA Avionics license, and had spent 10 years as an engineering supervisor with a major telecommunications equipment manufacturer before launching PAGE. His wife played an integral role as well from the very beginning as she had expertise in circuit board design and wiring installation techniques.

Starting a business just made sense to Eberle, who was an entrepreneur from an early age.

"There just wasn't enough challenge and I felt I would be better off getting into my own business," he remembers. "Running a business was not anything new for me, as I had been doing so on and off since I was about 13 years old while living outside the United States providing marine radio/radar service along with radio and TV repair."

Eberle says he had always enjoyed tinkering around with components, seeing how things worked and designing new ways to make them work.

From August 1976 to January 1979,

PAGE (a company name that consists of the two founder's initials) remained a two-man, part-time operation. This is not to say that Eberle did not keep busy. "My role in the beginning was mostly engineering, but at the startup of a small business, one has to do everything. No job is too low," Eberle humbly reveals.

PAGE was asked by GTE Sprint to manufacture heavy DC power distribution equipment for its central offices. "This we did with a vengeance as we were well qualified and could produce product immediately," Eberle says. "We provided the largest central office DC plant in the United States, a 25,000-amp system, for Sprint at Rialto, Calif. Nationwide, Sprint and the regional Bell operating companies were major customers."

Working with McCormick-Morgan and Hamilton Standard, PAGE spearheaded a project within the Rockwell B1-B aircraft production facility in Pamdale, Calif. From that point on, PAGE had an established product line in the 400-Hz marketplace, developing gate boxes, line drop compensators, military ramp power distribution equipment, hangar power systems and a multitude of other 400-Hz distribution components.



**"[Receiving this award] is a very nice way to get a degree of closure to my active role at PAGE. I get to stay involved, but the award reminds me that I've 'been there, seen it and done that.'"**

— Jerry Eberle, owner (retired),

**PAGE Industries**

## Turn the PAGE

In 1980, PAGE hired two employees and began producing several products. Eberle's wife Beth was well qualified in high-tech assembly and quality control. "She did both of these in the evening while holding a full-time day job at a large electronics manufacturer," Eberle reveals. "Food and rent are just a little important, and Beth's efforts allowed us to move forward in the shop."

Eberle says he grew the company carefully and slowly. By 1982 there were five employees at PAGE. By 1984, they had hired at least five more. By 1985, PAGE was heavily involved in aircraft ground support. Eberle says this is when the company acquired both a machine shop and a major painting facility. Then in 1987, PAGE purchased a large building and developed a significant production facility with about 40 employees.

Eberle and the business kept moving right along. "As we got busier, my role was mostly engineering and building first articles for evaluation," Eberle says. "We were very fortunate to have a good distributor for our ground support equipment, which relieved us from the need to spend time marketing."

Soon, though, the engineering load became overwhelming and they hired Frank Christian, "a very clever Cal Poly



engineer,” Eberle says. “In addition to our ground support equipment efforts, we became very involved with research and development for NASA and the railroads. Our customer base played a heavy role in designing reliability into our products, as everything we built required extreme reliability. For instance, some of our NASA product was designated ‘flight critical’ and ‘life critical.’ The safety mindset [learned early on] does not go away,” Eberle explains.

There were a few times in Eberle’s career where NASA engineers had exhausted their options to find the solution they were seeking. “These guys walked into our conference room with bags of parts, dumped them on the table, and said, ‘Help us.’ It was like having a very expensive erector set,” Eberle jokes.

One of those times was in 1998 when the ER-2 High-altitude Airborne Science Aircraft was sent up 80,000 feet with sensors that were to measure holes in the ozone. PAGE developed the payload instrumentation for this aircraft. “We were

## Simple Complexity

**MIDAS** Avg deice per aircraft: 0 # Aircraft per hour: 0:00 # of trucks service call status: 2  
 Avg time per aircraft: 0 # of trucks operating: 38 # of trucks out of service: 2

July 15, 2014 12:05:04 PM Lock Screen  
 Logged in as admin Switch User  
 Logout

Dashboard (MSP)

Deicing Trucks											Jobs						
Truck	Prod	Driver	Operator	Tail Number	Status	Deiced	Anti-icing	Fuel	Water	Chassis	Aux	Heater	Date	Tail Number	Airline	Prod	Trucks
101	Alpha	Leland Jensen	Brad Johnson	M07151	Good	10	25	20	20	✓	✓	✓	Jun 17, 2014 4:42 PM	M0747	Alaska	D9	001
105	Alpha	Kyle Hower	Andy Owen	M03255	Flt	10	20	20	20	✓	✓	✓	Jun 17, 2014 8:36 AM	M0747	American	D2	001
102	Alpha	Jeff Morrison	Brad Johnson	M07151	Good	10	20	20	20	✓	✓	✓	Jun 12, 2014 4:41 PM	M04333	Alaska	D3	005,028,001
104	D4	Karen Bowen	Jeff Walsh		Unassigned	0	0	0	0	✓	✓	✓	Jun 11, 2014 1:25 PM	M04333	Alaska	D4	011,001
103	D3	Daniel O'Brien	Karen Bowen	M00711	Flt	10	20	20	20	✓	✓	✓	Jun 5, 2014 2:22 PM	M07417	Jet Blue	D3	028,017
106	Alpha	Kenny McGee	Mark Brooks	M07151	Good	10	20	20	20	✓	✓	✓	Jun 5, 2014 1:15 PM	M04333	Alaska	D2	002,028,003,004
108	D4	Mark Stevens	Lisa Pool	M04333	Good	8	8	7	8	✓	✓	✓	Jun 5, 2014 1:15 PM	M04333	Alaska	D1	011,028,003
107	Alpha	Mark Stevens	Lisa Pool	M04333	Good	10	11	12	10	✓	✓	✓					
110	Alpha	TJ Johnson	Mike Wilson	M00711	Good	11	12	12	10	✓	✓	✓					



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able to engineer in a few days what they had been working on for months," he recalls. Later on, the company developed payload instrumentation for the space shuttle.

After that, PAGE became the go-to for NASA. There was a blanket purchase order, which meant that when NASA came calling, PAGE found a solution. "No one ever had to ask, 'What will it cost?'" he says.

A couple years after the ER-2 project, more bags of parts were brought to PAGE for the U.S.-Russia Cosmos 2000 project. "Monkeys were being sent into space, and they had been trying for three months to find a way to attach a skull cap to them. They needed a somewhat permanent solution but one that would not hurt the little guys because they were being sent up to do research. It took us a day and a half to solve that one," Eberle reminisces.

It was 2005 when Aea retired and Eberle elected to stick with engineering and not run a factory. This meant farming out the production of its products to trusted subcontractors as well as selling the building. To this day, PAGE subcontracts its production and confines its activities to engineering, quality control and marketing.

## Changing of the Guard

Eberle and Beth worked hard together for nearly four decades, nurturing PAGE Industries to build it into the thriving business it is today. When the subject of putting their careers on the shelf came up over dinner one evening, it was Beth who suggested they bring in Brian Piety to help them toward retirement. Piety seemed like a good successor, Eberle says, as he brings the same passion and customer service expertise that he and Beth did over the years.

"We discussed this very seriously, made the decision to go ahead, and approached Brian," Eberle says. "The timing was just right."

Piety's business relationship with the Eberles began in 1990 when he first entered the industry while working for Jetway. "Eberle and Lou Lombardi mentored me as to the complexities of central 400-Hz systems," Piety remembers. Then in 2000 when Piety began working for J&B Aviation, he really started

**"I hope everyone understands that while it is true Jerry is a brilliant engineer and business person, more importantly he is a great man and a good friend to me and the industry."**

**— Brian Piety, president, PAGE Industries**



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interacting with the Eberles more consistently. Eberle, at that time, utilized J&B to sell and market his products to the airline industry. In 2012, PAGE began selling its products directly to end-users, which continues today. Those traditional products included 400-Hz gate boxes, load point control units, phase sequence testers, re-active load banks, baggage chutes, gate

park systems, and PCAir hose reels and connectors. These product advancements are now commonplace in the industry.

“When Eberle and I started working together at PAGE, he took a more hands-on mentoring approach to educate me not only on the integrities of the PAGE product line, but also how to run a successful business, how important the selection

of good manufacturing partners are to the longevity of the company, and what pitfalls to be aware of that otherwise might have been overlooked,” Piety says.

Piety joined PAGE in 2013 with the intention of developing a revised PAGE that would offer a greater selection of GSE products in addition to the high quality electrical power equipment, gate park systems and baggage chutes, which PAGE was previously known for. In January 2013, Shelly Morehead joined PAGE as inside sales coordinator and by March of that year Bruce Hrenko and Dale Miller also joined the company as partners.

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**“It always amazes me when Jerry and I are talking to an expert in a specific field and Jerry will explain to that individual how they can improve their product. Of course they take his advice and do as he suggests.”**

**— Brian Piety, president,  
PAGE Industries**

"Eberle remained on as president and controlling partner until January when he retired from PAGE, although he remains a very active and crucial consultant to PAGE. Currently, ownership has transferred to Bruce Hrenko, Dale Miller and myself," Piety explains. In January, Piety took on the role of president and majority owner with Hrenko and Miller as the remaining owners, "who bring their vast expertise and knowledge to PAGE," Piety says.

When asked what he has learned from working with Eberle over the years, Piety replies, "Jerry is the overall smartest person I have ever met as he knows a great deal about a very diverse amount of related and unrelated items. It always amazes me when Jerry and I are talking to an expert in a specific field and Jerry will explain to that individual how they can improve their product. Of course they take his advice and do as he suggests. This happens on an on-going basis.

"But more important to Bruce, Dale and I is that Jerry and Beth trusted us to take over the company—their 'baby' that they worked so hard to create. With Jerry and Beth's assistance—and Bruce, Dale, Shelly and I joining together—we have created a well-rounded, creative and strong team that is bringing more new and innovative products to market than any other supplier in our industry."

When asked what receiving this award means to him, Eberle says, "This is a very nice way to get a degree of closure to my active role at PAGE. I get to stay involved, but the award reminds me that I've 'been there, seen it and done that.' Brian, Bruce and Dale have the opportunity to prosper and control their destiny at a time when they have the experience to make the most of it."

It is important to Piety that everyone understands that while it is true that Eberle is a brilliant engineer and business person, "more importantly he is a great man and a good friend to me and the industry."

Many people in the GSE industry rely on Eberle to solve the most difficult problems they encounter. Eberle always has time to fully answer people's questions and in a manner they can understand, be it in very simple terms to extremely intricate ones, depending on the

understanding of the person to whom he is speaking.

Piety concludes, "He has been and will continue to be a business mentor to Bruce, Dale, Shelly and I, but he will also be the heart of PAGE as we carry on his legacy." ✈️

## About the author:

*Sharon Spielman has been a freelance writer and editor for the trades for more than two decades. She resides in Lake County, Ill., with her husband and two teenage boys.*

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## China's Airport Growth Plan

*With a wave of new airport construction, what does it mean for GSE manufacturers and suppliers?*

*By Francis Chao*

**C**hina currently owns and operates 202 commercial airports and 300 temporary landing strips across the nation, serving a region of 9.6 million square kilometers and 1.3 billion people. In the last decade, China has retrofitted, expanded and newly built 10 to 15 regional airports per year. This sector's speed will be maintained in coming years, and will be accompanied by other new developments in China's major hub and general aviation airports.

China's central government has approved the construction of a second hub airport in the nation's capital, the New Beijing International Airport, which is expected to be put into commission in 2019. At the same time, the CAAC announced that China will build 2,800 GA airports in total, located in each of China's 2,800 counties before 2030. This wave of construction will keep GSE manufacturers and suppliers busy for quite some time.

The New Beijing Airport is designed to accommodate 45 million passengers annually on its opening date in 2019,



eventually reaching 72 million passengers annually in 2025. Four runways and a 700,000-square-meter terminal are central components of the project, and the final phase of construction will result in a total of seven runways and 100 million passengers annually.

However, since China's low altitude airspace has not yet been opened to general aviation activities, there are no GA airports currently operating in China. This has greatly affected China's capacity for training new pilots, developing remote areas, and building an adequate



B747-400 readies for fueling at Beijing Capital International Airport.  
PHOTO PROVIDED BY FRANCIS CHAO

GA industry. Most of all, this has delayed China's capability and response time for emergency rescue services that are needed in the event of natural or manmade disasters. Nevertheless, China's government has recognized the need for gener-

al aviation and has proven itself willing to take the lead in building this long overdue industry by determining to build GA airports in each of China's 2,800 counties.



Baggage and cargo containers at Beijing Capital International Airport  
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## Opportunities abound — maybe

What does this mean for GSE makers and suppliers? Possibly everything, and possibly nothing. China is famous for building everything on enormous scales, including its international hub, regional, and GA airports and terminals. The New Beijing Airport presents many business opportunities for equipment manufacturers and suppliers that specialize in equipment that accommodates the special needs of larger airports. Local manufacturers cannot produce or supply equipment for these large airports, leaving only international manufacturers to fill that gap. However, as I'm sure you already know, such equipment is not necessarily needed by smaller regional airports, and the equipment they do use is already made by local manufacturers that can provide similar products at more affordable prices.

The continued construction of 10 to 15 regional airports per year and the appearance of a great amount of GA airports in next 15 years create another scenario that may make you reconsider the Chinese market for your products and services. Not going into the Chinese market because somebody has already

copied your products or you are afraid somebody might copy them in the future is certainly an option, but it is one that will not help your business at all. Even if you stay out yourself, if the market demand is attractive enough for a company to consider local assembly and manufacturing, somebody else will eventually do it themselves.

## Take advantage of the situation

While China is encouraging its local governments to involve themselves in the building of its aviation industry, many local governments are also providing special subsidies or land benefits to aviation-related manufacturing projects and businesses. This provides both international and local GSE manufacturers and suppliers an opportunity to take advantage of the situation by working together to meet international standards while still being affordable enough for local airport operators.

The continued growth of China's market forces one to reconsider the strategy for customer support and service in such a marketplace; a strong local after-sales service and technical support team should not be too far away from local assembly and manufacturing facilities.

If you are not selling to China yet, perhaps considering the potential market size will help you recalculate your chance of success. And teaming up with some local Chinese market players will lower your operational and production costs.

The situation in China for the airport GSE business today reminds me of the similar situation of the small aircraft manufacturing industry in the last 20 to 30 years, during which the FAA insisted on high standards for aircraft certification. Due to the advanced technology of materials, CAD/CAM, and production and engineering management factors, aircraft made according to ASTM standards from other countries very quickly came to surpass FAA certified aircraft in economy. Now the FAA also has categories for aircraft made according to ASTM standards.

## New CAAC Regulations

While a vast amount of information is available on the Internet, access to al-

most every technology is also available off-the-shelf, making it easier than ever before for competitors to make a product similar to yours. Given that, here is another reason to consider local assembly and manufacturing. In March 2015, the CAAC announced new regulations on the approval of organizations that inspect and certify specialized airport equipment for use in China, which means that if you are not certified by a CAAC accredited organization, you may not be able to sell in China in the future.

Anybody who follows up on the story of China's development of EMAS for runway safety will understand how market factors and complexities in local certification can cause you to lose control of the market if you fail to adequately team up with local Chinese players already familiar with the system. This strategy may seem unethical, but it has proven itself to work well in protecting local competitors. While I am certain this strategy did not

originate in China itself, Chinese companies are nonetheless implementing it very successfully in many areas to their own advantage. At this point, the steady growth of China's airport market in the next one or two decades may give you the opportunity to leverage all the challenges of doing business in China into success for your company. Finally, do not forget the subsidies and land benefits that will be offered to you if you consider teaming up with a local manufacturer to work toward your mutual benefit. ✈

## About the author:

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# Ground Damage Reporting

*A ground damage event does not directly harm the safety of flight because it should be detected and reported. Unreported damage, however, may affect the safety of flight. Undetected damage means that an organization is failing both in the prevention of events and in the implementation of recovery measures after a safety event has been caused.*

By Mario Pierobon

**A**ircraft ground damage is expensive and compromises the safety of crews and passengers on the apron, it is such a significant issue that it sits very high in the agenda of aviation executives; it is also being addressed by a variety of industry programs and working groups.

Yet there is something even more subtle than aircraft damage itself and this is unreported damage. Undetected structural damage, at its worst, can carry very serious damaging potential. Although it is quite accurate to state that it is more often minor damage to go unreported—i.e. dents or scuffs on the fuselage—this type of damage should not be there in the first place and should always be reported, especially now with the increasing use of composites.

Maintenance managers are perhaps

the most vocal to complain about unreported damage because it falls into the maintenance budget, whereas instead these repairs should be invoiced to the cost centers of the entities actually causing the damage. Airlines appear to have historically treated these minor—unreported—events as a normal cost of doing business, but things are now changing.

With the implementation of safety management systems (SMS) even in the domain of aircraft ground handling, the reporting sensitivity of personnel is

increasing. Hopefully the industry will mature to the point that operators will be able to actually define accurate statistics on the incidence of ground damage and to better appreciate and manage the associated costs.

The theory behind SMS is that accidents and other serious safety events are only the tip of the iceberg; there is an exponential relationship between major events and minor events manifesting or carrying some damaging potential. Latent conditions are those organizational processes with the potential of causing a loss in a particularly unfavorable combination of circumstances. Time pressure and the likes of an untrained employee performing ground handling services can be considered as latent conditions or precursors to damage events occurring on the apron. A ground damage event does not directly harm the safety of flight because it should be detected and reported. Unreported damage, however, may affect the safety of flight. It is important to reiterate that it is normally minor damage that goes unreported; the issue of under-reporting should not be treated light-heartedly, as undetected damage is both an accident outcome and a latent condition. Undetected damage means that an organization is failing both in the prevention of events and in the implementation of recovery measures after a safety event has been caused.

## Found/reported ratio

To define an approximate reported/found ratio of aircraft damage events can be a very difficult exercise for airlines. Canadian operator Jazz Aviation since 2013 has had a total of 224 reported damage events; 61 of these have been classified as



*Time pressure and the likes of an untrained employee performing ground handling services can be considered as latent conditions or precursors to damage events occurring on the apron. Reporting incidents can be increased through active encouragement and the application of the concept of "just culture."*

*Photos courtesy of Jazz Aviation*



of 'unknown' origin. This is 27 percent of all reported damage; but as to how much is repaired, the airline does not have a picture of how much repaired damage went unreported, say Brent Boden and Geraldine Hamilton from the safety management department of Jazz Aviation.

A similar challenge is encountered also by British carrier Easyjet. "We find it very difficult to compare our reporting rates to other airlines and handlers due to the many different reporting descriptors across the different safety management systems employed in the industry," says David Cross, ground operations quality and safety manager at Easyjet. "This figure also varies as to which department takes accountability for ground damage. At EasyJet we have an improved reporting rate as we actively encourage an open reporting culture."

The fact that there is an improving reporting trend is also confirmed by data supplied by Qatar Airways: "We have reversed the trend over the last two years. From approximately a 60/40 found/reported ratio our current ratio is 10/90," says Mark Corbett, manager of ground safety at Qatar Airways.

## Incentives to report

There needs to be some reasons why aircraft damage events can and often go unreported when they occur. One of the possible reasons is that line employees are not given enough incentives to report.

"The main reason for under-reporting we have found is the non-application of 'just culture' principles. Companies, even in the UK, still employ a 'shoot first, ask questions later' policy with ground damage incidents. Until all ground agents feel that a fully developed 'just culture' philosophy is in place then there will always be a fear factor to reporting incidents," says Cross.

Improving ground damage reporting figures can be derived from the strengthening of the 'just culture' movement in the ground operations domain of the international airline industry. According to Corbett, Qatar Airways' positive figures in terms of a considerably improved found/reported aircraft damage ratio is because the airline has been actively promoting non-punitive reporting for the greater benefit.



This view is shared by Boden and Hamilton who affirms that Jazz Aviation has an SMS which "includes a non-punitive reporting policy so if damage is not reported and we discover who did it, it can be punitive; however we seldom do as we choose to take the high road to encourage further reporting." According to Boden and Hamilton there must be a way to better define the just culture ideal of not including discipline even if an employee did not report the event: "this is a critical step because even if the safety reporting policy does not protect the employee (due to their disregard for safety report), there is great impact when an employee is found to be guilty of causing the event without reporting it, yet they are not disciplined. For example, if an employee damages aircraft and the event is not reported due to their embarrassment or fear of persecution and discipline, the company has a great opportunity here to teach the employees the benefit of cooperating with the investigation even if not reported. If a person is disciplined because they did not report the event, from a legal perspective the company should not explain to the rest of the workforce why that person was disciplined. Because of this there is misinformation within the workforce that the fellow was disciplined after a damage event.

"Without being able to tell the

workforce the entire truth of what happened with this individual, the misinformation within the workforce will be extremely detrimental to the reporting culture and the safety level on the ramp and of course the destruction of the just culture we all should wish to provide," say Boden and Hamilton.

## Awareness on damage causation

Another possible reason of the under reporting of aircraft damage events is that employees are not aware of causing damage, although this is rare. "I personally do not believe that under-reporting is a result of lack of awareness to damage caused as this is part of training right from the outset for all ground agents. Constant reminders on the importance of reporting all ground damage incidents are also in place," says Cross.

Boden and Hamilton have a similar view: "It is hard to believe that someone damaged a vehicle or aircraft and did not know they did it. However, we are sure it could happen, such as in the case of a static wick being knocked off."

Corbett recognizes the potential for non-deliberate non-reporting of aircraft damage events and stresses a need for "increased awareness of potential damage especially with the introduction of composites, which have the peculiar property of not denting in case of collision



so any slight touch needs to be reported for inspection.”

## Was the damage pre-existing or was it not?

The inability to ascertain whether a given damage is or is not pre-existing is indeed associated to the non-reporting of aircraft damage events. The same factor compounds the difficulty in track-

ing accurate figures of the incidence of aircraft ground damage as well as the found/reported ratio.

One solution in this respect is the use of stickers, but these sometimes can fall off and damage gets reported again, say Boden and Hamilton who also add that at Jazz all damages are tracked using bingo stickers.

The issue is also recognized by Corbett who says that “determining old damage from new damage is difficult as most carriers do not like stickers of kinds placed against paint to identify damages by dates.”

## Improve reporting sensitivity

What can ground handling companies do to improve the current status of things? What can be done to improve the reporting sensitivity of personnel? In this regard Corbett further underlines how the promotion of non-punitive reporting has considerably helped Qatar Airways

improve the found/reported ratio.

Boden and Hamilton highlight that other incentives such as contests may help. However, contests have the downside that safety departments may end up having a hard time keeping up with investigating the reports received. Jazz Aviation receives over 550 reports per month, these include ground safety, air safety and occupational health and safety reports, say Boden and Hamilton.


## Improved damage detection

More thorough damage detection is another strategy which can support an improvement in the found/reported damage ratio. The walk-around is that part of operations which can best supply a well-defined layer of control in damage tracking, on top of course of releasing airworthy aircraft.

According to Boden and Hamilton, operators should “do a blitz on walk-arounds with pilots, ground and maintenance personnel to ensure they are detailed enough and complied with.” Corbett encourages “constantly ‘walking the patch’ and encouraging people to be open. We have also embarked on production of a series of turnaround videos to be constantly displayed via intranet and on staff break areas on continual loop TV.”

## Generating efficiencies

According to Cross, efficiencies in reporting can be increased through active encouragement and the application of the concept of ‘just culture’. Cross, however, also stresses that further opportunities exist in equipment design. “The International Air Transport Association (IATA) is currently exploring ways to develop requirements for ground service equipment (GSE) design and increase safety standards. In today’s world it is possible to buy a budget car that will park itself and warn of any impending impact but GSE design has not changed for more than 30 years. The use of GSE ‘black boxes’ will also aid investigations to bring to light systematic failures and areas worthy of procedural improvements. Telematics have been available to the general public for a number of years for automobiles and these systems should be simple enough and transferable to airport equipment.




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## “Actual repair costs are minimal compared to the consequential costs in terms of brand/image protection, customer retention, social media bad press, etc.”

This would also offer cost savings with the ability to track equipment and reduce levels of equipment currently being utilized on airport ramp areas,” says Cross.

In relation to GSE design IATA’s Ground Support Equipment and Environmental Management (GSEE) task force comprises technical experts from ground service providers, airlines, GSE manufacturers and aircraft manufacturers. According to the association’s website, the task force focuses on the technical, functional and safety aspects of GSE as well as the impact GSE has on the environment. The task force continually reviews and develops the policies, strategies and guidelines as published in the IATA Airport Handling Manual (AHM) in the following areas: technical standards and specifications for all types of GSE, the interfaces between aircraft and GSE, aircraft and GSE design modifications to address ground operations needs and environmental guidelines for ramp operations, the website notes.

In relation to generating efficiencies from more consistent reporting and improved damage detection, Corbett highlights how benefits can be derived which go beyond the direct costs of repairs: “Actual repair costs are minimal compared to the consequential costs in terms of brand/image protection, customer retention, social media bad press, etc.”

According to Boden and Hamilton in order to generate large scale efficiencies it is important to involve all stakeholders in the process: “We can report more, but no financial benefit will be found unless we do a better job of gathering all the costs and improve contracts so the providers are held accountable to the cost, however this may decrease reporting as it increases the providers’ costs and they cannot afford to do the work. Some of the ground providers are small companies that could never survive with bills for major repairs.”

### Maturing SMS

Scheduled international airlines, after

several years of implementation, now have effective SMS in place. Because of the airlines’ leadership of the aviation industry, advances in SMS implementation are also being made by ground handling companies, with the recently turned mandatory character of SMS requirements within ISAGO marking a significant commitment from ground handling companies.

In order to have effective SMS in place, ground handling companies need to develop on the ground the cultural dynamics sustaining reporting that peculiarly characterize the flight operations’ side of the airline business. With the solid adoption in the cockpits of crew resource management, lower ranking crew members have the opportunity to speak up for the

sake of operational safety and internally report hazardous events. This has not always been the case and it has taken a long time to develop.

Implementing an SMS cannot be a bureaucratic exercise; it needs commitment and a culture that sustains it. This can only happen so long as employees are empowered to feel they ‘own’ their job, are valued for their contribution and supported when they report the errors they make in good faith. ✈️

### About the author:



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# Flight Delayed?

## Make Sure It's Not Because Of Broken Down GSE

**M**ost commercial airline travelers have heard the following message come over the public address system on at least one occasion, “Today’s flight will be delayed today due to mechanical issues. We will update you as we have more information on when we will be able to depart. Please stay near the gate area for further announcements.”

Commercial aviation is an amazing production. Hollywood has nothing on the airports, airlines and their army of worldwide staff when it comes to getting people from one place to another, safely and on time. While the airplanes are arguably the star of the commercial aviation show, ground support vehicles, equipment and their operators represent the many producers, stuntmen and directors whose expertise is required to



*With the many variables that can impact an on-time flight departure, GSE must continually be in optimal condition and on standby to service and support the hundreds of flights that take off and land each day.*

*By Edward Talerico*

ensure that the show goes on.

With the many variables that can impact an on-time flight departure, GSE must continually be in optimal condition and on standby to service and support the hundreds of flights that take off and land each day. Ground support staff do not want their service or equipment to be a factor that caused a flight delay.

According to an April 2014 reports from the Air Transport Action Group,

The commercial aviation industry used **25,332** aircraft to transport **3.1 billion** people to **3,864** airports worldwide.

the commercial aviation industry used 25,332 aircraft to transport 3.1 billion people to 3,864 airports worldwide. With fuel trucks, tugs, belt loaders, catering trucks and other vehicles required to help each plane get in the air, those numbers represent a lot of ground support equipment as well.

## EAM SOLUTIONS

Modern enterprise asset management (EAM) solutions play a major role in helping ground support professionals be successful. With EAM systems built expressly with the needs of GSE companies in mind, personnel have the management tools needed to monitor, track and analyze the complex workflows and related data. The easy access to data helps personnel make decisions quickly, evaluate best options and share insights throughout the value chain.

A key component of successfully managed ground support operations is tracking and managing vehicles to capitalize on opportunities for productivity and cost savings. Ground support organizations require effective asset management strategies and tools to contend with the high pressure and high expectations surrounding commercial airline travel. Today's EAM systems provide a centralized repository of an organization's equipment and usage so company staff can always know where their equipment is and whether it is in use. Fleet management and tracking is imperative to ensure the right equipment is available with the right plane at the right time.

Another key to successful ground

support operations is an effective MRO system. These systems help manage the complexity of servicing critical equipment:

- **Make sure equipment is in optimal working condition.** During the safety briefing at the beginning of each flight, airline passengers are instructed to put on their own oxygen masks before assisting others. The spirit of this sentiment rings true for ground support companies as well. The successful ground support organization needs to make sure it provides the same high maintenance levels to its own equipment as it does to the aircraft they support.
- **Maintain accurate and detailed records.** It's important for ground support staff to have a firm understanding of their company's maintenance capabilities. Extensive documentation is also important for the audit trail and reporting needed to comply with federal mandates. Accurate documentation is an effective way to communicate the kind of service and maintenance an organization undertakes for each piece of equipment. With a software-based, central repository of comprehensive equipment maintenance tracking, the facility can be confident all staff have the information available to manage service and repairs while also maintaining reporting and regulation compliance.
- **Build and monitor maintenance schedule plans.** There are always going to be those circumstances that could never have been planned for in



advance. However, it's important that these instances are the exception and not the expected standard operating procedure for a ground support organization. Maintenance schedule planning allows for the building of a single look at all of the preventive and predictive service needs across the equipment fleet, while also allowing the planner to accommodate the unexpected service needs that inevitably arise.



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## MAINTENANCE SCHEDULE

Ground support organizations can use today's software systems to automatically schedule preventive maintenance procedures, minimize impact on operations and compensate for maintenance jobs that are completed either sooner or later than expected. Modern EAM software makes it much easier to track individual assets by their cost, lifecycle progression and position in the broader context of a company's equipment, systems and locations. These software tools also allow companies to track usage with precision, using metering capabilities that support an unlimited number of meters across the equipment fleet. With metering information and other data collected by predictive analysis tools, ground support companies can intelligently estimate when an asset will fail and take corrective action.

By taking preventive maintenance planning seriously, ground support organizations can maintain their equipment more cost-effectively and with fewer disruptions to the service they in turn provide to the airlines and aircraft they support. A master schedule allows ground support personnel to forecast maintenance activities and identify the required material, labor, skills, tools and equipment for specific projects. With each piece of equipment on a service schedule, the right people, parts and tools can be allocated for more efficient repair and upkeep. In addition, an alternate piece of equipment can be scheduled to be in place planeside while the other is repaired.

A well-orchestrated maintenance schedule plan also allows ground support companies to maximize workforce productivity. A plan that aggregates staff and service schedules along with all aspects of work already performed on equipment—from installing new parts to issuing corrective or preventative maintenance work orders—is a very powerful tool. With a maintenance schedule plan, ground support organizations can track and manage work requests, labor, planning and scheduling to get the greatest return from their human resources and physical assets.

In addition to the staff and equipment service scheduling, a ground support organization's maintenance schedule plan also includes advanced planning for necessary materials. This advanced planning capability allows for material management by individual warehouse and can support various replenishment methods—including in-house, manufacturing, purchasing and distribution from other stores.

Advanced planning capabilities can also be used to create manufacturing, distribution, purchase order or maintenance orders per each replenishment method—all while taking into account the required lead time. Ground support organizations can use the advanced planning features in EAM systems to dynamically initiate replenishment processes without requiring a staff member to set it into motion.

These replenishment processes may initiate based on several factors, including available inventory falling beneath a certain level or an upcoming scheduled service needing parts before the equipment enters the service bay on its scheduled date:

- **Equipment inspections as part of a preventive maintenance strategy.** The aviation industry firmly understands the importance of inspections for equipment safety and

reliability. This understanding extends beyond the aircraft itself and applies to the ground support equipment as well, proving to be an important part of a preventive maintenance strategy. Ground support organizations can efficiently manage inspections with EAM systems that build and manage qualitative and quantitative inspection schedules for individual assets. These schedules gather information to understand how equipment is operating so ground support can better manage the asset and materials needed to operate it. These software systems can also issue corrective work actions when an inspection result exceeds a preset limit.

▪ **Have only the necessary parts in stock.** It is important to minimize inventory costs without impacting operations. While keeping fewer parts on hand can be cost-effective, it can result in increased costs if equipment is sidelined while waiting for a necessary component to be ordered and delivered before service can begin. With today's EAM software, ground support companies can be sure they have the right parts available in the right quantities to efficiently take care of repairs and support spikes in their operational schedules. Understanding part interchangeability and configuration-dependent constraints is also important for ensuring the right parts—and enough of them—are available when needed. Rather than maintaining binders of parts and configuration data for each piece of equipment, an EAM system can help manage the full parts list. In addition, these software systems go beyond just keeping track of parts to maintain a record of the interchangeability and configuration-dependent part characteristics. EAM software can be used as a configuration record library to hold the lifetime parts and installation services data for a particular piece of equipment.

Purchasing is another key component of a ground support organization's inventory management system. With the advanced purchasing management capabilities in today's EAM systems, procurement teams can make sure the right parts have been ordered for each piece of equipment. In addition to efficient ordering, purchasing management features also help monitor on-time delivery of materials, vendor performance management, payments and receipts. Many EAM systems even go beyond part ordering and fulfillment tracking to include the ability to plan work, track parts usage, manage stock levels and replenish stock via the Internet.

## WARRANTY TRACKING

Warranty tracking on critical facility equipment and components has high financial impact on GSE.

There is a wealth of cost savings available from effective warranty management. EAM systems accommodate the management of different types of warranties, including manufacturer warranties for parts, for entire component structures and for repair and services. There is no need for a ground support organization to take on an unexpected service repair itself if the equipment and repair in question is still under warranty from the manufacturer. In addition, warranty management features within the EAM system can automatically send a notice if a maintenance order is issued for material still under warranty.

Commercial aviation is an intricate and complex undertaking. From the aircraft and airports, to the weather and the

travelers themselves—there are many opportunities for flights to be delayed and planes grounded. While not all of these variables are within one's control, it's imperative that those in the industry do their best to take care of the variables they can control. Ground support equipment maintenance is one of these controllable areas.

Taking care of the equipment that takes care of the planes is no small feat. With the help of today's EAM and MRO systems, ground support professionals have help to keep their equipment performing well and reduce their chances of becoming part of a flight delay scenario. ✈️

## About the author:



*Edward Talerico, Infor's Industry Strategy Director, Aerospace & Defense, has more than 25 years of experience in the information technology space. Talerico has held various roles from solutions management to consulting services. As an almost 20-year Infor employee, he has deep expertise and is responsible for industry strategy across both the aerospace and defense and high-tech industries. Prior to Infor, Edward spent 10 years at Lockheed Martin selecting ERP systems.*

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## Ground Handling Mishaps

*Looking at some safety authority numbers leaves few questions as to why we seldom see a safety investigation or accident report involving ground-handling incidents. It's not because they don't occur.*

*By Dave Higdon*

Looking at some safety authority numbers leaves few questions as to why we seldom see a safety investigation or accident report involving ground-handling incidents. It's not because they don't occur (as anyone with a modicum of operating experience well knows), but so many fall short of the level of damage that clears the reporting threshold for "incidents" and "accidents" befalling operating aircraft. By "operating" we

mean any phase of flight operation, from takeoff to touchdown. And yet, with some frequency, ground mishaps do happen.

Once clear of the runway, aircraft typically travel at speeds which (instinctively, at least), impact operators' actions in such a way that reduce the potential for serious aircraft damage, injury or fatality. But those instincts often fail to account for the potential energy of large mass impacts even when

moving at low velocity... Such dissipations of energy can render aircraft unfit to fly.

A National Transportation Safety Board (NTSB) examination of airline and general aviation safety noted ground handling and ground incidents to be among its top four, over several reports. In a majority of cases the transport category aircraft needed repair before returning to service. It's well worth noting the amount of training,



practice, qualification and experience levels required to tug airliners on an airport ramp, yet in some instances it's the flight crews—not the tug drivers—who precipitate the event.

In general aviation, of course, the fleet size dwarfs that of the airlines. The same applies to airport variety, and consequently the indigenous conditions and the experience of pilots and ramp staff.

When the repair costs of taxi and tug accidents fall short of the NTSB's reporting threshold, the event is not counted among others as accidents or incidents. But taxi accidents, both fatal and (overwhelmingly) non-fatal, ranked around seventh on a list of the 10 defined causes. The tab for ground mishaps amounts to millions in insurance claims, as well as the expense of replacement lift while repairs are made.

## GROUND-BASED RISKS

There's no question: No two objects may occupy the same space at the same time. In reality, over most of the planet the combination of millions of square miles of open sky and positive control practices of various air-traffic-management agencies render such a likelihood "minuscule"—yet even then, the higher risks of aerial encounters exist in the crowded skies of the world's major airports.

When on the ground, aircraft face far more risks from the various other participants sharing that airport real estate—and not only other airplanes: Fuel trucks, tugs, support vehicles, catering trucks, buildings, obstacles—the ground area of an airport is a very busy place indeed.

Ground events occur during the seemingly simple act of towing an aircraft out of its hangar; they happen to aircraft parked on ramps; at the tips of other aircraft's wings. They occur when ramp staff works a crowded corporate hangar to remove the one way in the back of said hangar.

One single-engine propjet operator of our acquaintance suffered the errant indignity of sitting in the cockpit for a tow out to the ramp, a move designed to protect the occupants from

the sub-freezing conditions outside. But a confused signal and a tight turn brought the tow to an abrupt end when the tug dragged the aircraft to a spot where a prop blade impacted a low obstacle.

The bend in the blade barely showed—until a friendly journalist suggested taping a piece of wire coat hanger to a parking cone and checking all four blades for any run-out... and there it was—all of an eighth of an inch—0.125! The mechanic who was called to assess the damage offered, "You probably would feel it more than see it, but feel it you certainly would."

The prop blade also showed damage at the hub—a strain crack of tiny proportions but huge implications. That strain crack might well have led to a blade failure. "Now that would have shaken us to death," my acquaintance noted, "if the vibration didn't break the engine completely off its mount!"

So something as simple as moving into a hangar with a shorter door span puts an aircraft at risk—particularly at home where crew tend to adapt to each customer's specific airplane. Likewise, taxiing from runway to ramp without minding the taxi guidelines painted on the pavement catches radomes and wing-tips, tail cones, gear doors and winglets. And the catering truck driver accustomed to dragging luggage trains under the wing may need added training to remember how much higher that rig stands.

Vehicles driving on ramps frequently show up in volunteered reports to various safety organizations. Complementary to the multiple risks aircraft face on airport ramps and in hangars is the variability in what airports demand and enforce on the

businesses they allow on the field.

Varying training requirements, differing operational standards, and wildly divergent insurance requirements all help add up to a challenge: identifying best practices for ground handling, then creating a system encouraging their use, creating a program, training and auditing of participants for adherence to standards, and repeating the process often enough to assure its use.

That's the work IBAC and NATA accomplished and announced in July 2014 in the form of IS-BAH following several years of work with domestic and international business aviation groups—efforts to promote the use of industry best practices blended through a progressive safety management systems (SMS) for FBOs and business aircraft handling agencies (BAHA).

Although national requirements for FBOs and BAHA operations to adhere to the standard may take time, aircraft operators' recognition of adherence to IS-BAH standards will grow quickly as implementation takes hold and spreads. That may well turn into a change in visiting habits by some operators anxious to improve the odds of falling victim to "ramp rash" or "hangar chaffing." And those operators may also realize some opportunities to save on their insurance if underwriters recognize the value in their clients limiting their FBO use to IS-BAH adherents.

If IS-BAH catches on as well as IS-BAO standards have, expect that point to soon be showing up in FBO ads and promotions. In the meantime, remember—let's be careful down here. 🚧

## About the author:

*Dave Higdon writes about aviation from his base in Wichita, Kan. During three decades in aviation journalism, Higdon has covered every aspect of civil aviation from sport flying to the airline industry. He spent several years covering the aviation regulatory and political affairs in Washington, D.C., including all the relevant agencies and interest groups. An active instrument-rated pilot with more than 5,000 flight hours in everything from foot-launched wings to business and combat jets, he currently writes for Avionics News, Plane & Pilot, Aviation Safety, World Aircraft Sales Magazine, and on his podcast, Uncontrolled Airspace.*

## There's No Such Thing as a Little Ice

*The Wing Armor portable anti-icing system helps ground crews safely and efficiently apply anti-icing fluid*

By Walter Randa

**C**harter aircraft and private planes typically have one of two options for anti-icing. It can be applied inside the hangar or aircraft can head to the airport deicing pad and pay thousands for it. One option is costly; the other can be unsafe.

"A lot of operators are doing this [anti-icing] behind closed doors," says Walter Randa, CEO of Leading Edge Deicing Specialists and Wing Armor. "They have the wrong understanding that they can put the fluid on and push the airplane out at any time. The reality is that as soon as the first drop hits the airplane, you've got a countdown going on. And by the time they push the airplane out the stuff on the wings already may be expired or have experienced evaporation."

Randa shares a few horror stories he's seen as a consultant with Leading Edge and an instructor of aircraft deicing and winter operations since 1992. In this capacity he's worked with teams operating corporate jets for companies like Victoria's Secret, Walmart, IBM, Kodak and Pepsi Co.

When anti-icing fluid is applied in the hangar, Randa has found crews pay little attention to timetables that compare temperature and weather conditions to determine how long the application will last. "This past winter we had a company spray an airplane at midnight for a 6:30 a.m. departure," he says. "By morning that fluid had evaporated."

In another case, crews, using a homemade spray system, doused an aircraft with far less than the 27 gallons of fluid required to adequately cover it. In this case, the ground crew had only sprayed 4 gallons on the entire aircraft, according to Randa. The insufficient amount of fluid caused the flight crew to experience a temporary loss of control in flight after takeoff.

Workers also fail to check anti-icing



*The dual nozzles on the Wing Armor anti-icing system allow ground crews to simultaneously douse both wings of an aircraft with anti-icing fluid.*

fluid's viscosity before it is applied, says Randa. "It could be that the fluid has sheared to the point where it's not even going to do what it's supposed to do," he says.

And then there's the fact that ground crews are often using home-built anti-icing units that they cobbled together on their own, and these units often have trouble spraying fluid evenly and efficiently. "One of my customers had a Gulfstream G650 and it was taking them an hour and 15 minutes to put fluid on one aircraft. The fluid was only good for an hour, so by the time some-



*The Wing Armor anti-icing system's control panel is intuitive. There's an off/on button and emergency stop button and meters to track spray in the fluid tank and the compressor tank.*

one pushed the aircraft outside, the fluid on the wings had already expired," he says.

These home-grown anti-icing systems also lack meters to tell ground

crews how much fluid they are spraying on the wings. "These guys are shooting from the hips and taking a guess at what's going on," he says. "They are guesstimating that they put enough on. The fluid quantities between the left and right wing should be within 10 percent. The consequence or result of not doing this can be asymmetrical lift."

It is these stories, and a request from a client, who asked if Randa knew of a manufacturer who produced a portable anti-icing unit, that led to a Leading Edge innovation that allows ground crews to apply anti-icing fluid to very large corporate jets (those with up to 150-foot wingspans) in the hangar, avoiding the deicing pad at the airport altogether, reducing fluid application waste, and ensuring a safe flight.

"Now they can go straight to the runway, avoiding all the lineups and the deicing pad, and avoiding the average cost of \$10,000 to \$15,000 to spray a business jet the size of a Gulfstream 650," Randa says of the Type IV anti-ice spray system Leading Edge developed.

## PUSH FOR A PROTOTYPE

Before beginning work on the Wing Armor anti-icing system, Randa did his homework. He went to visit a company that had fashioned together its own anti-icing unit, and asked users what they liked and disliked about the unit, and what features they still needed.

"I basically built a prototype based on everything they said they didn't like," he says.

Randa tweaked the product many times during development. For instance, he initially designed it with a 30-gallon tank but he eventually increased the tank size to 60 gallons when he realized a Gulfstream G650 could use more than 50 gallons of anti-icing fluid. Randa also decided to use stainless steel for the tank so the fluid could remain safely in the tank without degradation. The rest of the product is constructed of high-grade aircraft aluminum and comes with a five-year warranty, though it will likely remain in use much longer.

## WING ARMOR OPERATION

Typically operations perform a deicing and then an anti-icing application on an aircraft. If there's time, the aircraft deices on its own in the hangar. If not, ground crews use trucks to apply Type 1 deicing fluid via nozzles that pump \$2,000-\$3,000 of fluid per minute. They then follow this with an application of Type IV anti-icing fluid.

It's important to distinguish that the Wing Armor system



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is designed for anti-icing not deicing. It does not include a fluid heater, says Randa. The unit's sprayer dispenses the appropriate amount of Type IV fluid, after the aircraft has been deiced.



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# PRODUCT PROFILE



**Large wheels and a tow-bar make it easy to maneuver the Wing Armor anti-icing system inside a hangar.**



The Wing Armor system tracks the amount of fluid dispensed to prevent over-spray, which also saves money. The \$65,000 Wing Armor sprayer can treat a G650 with about \$300 worth of fluid in 15 minutes, according to Randa. The Wing Armor spray system includes 240 gallons of Type IV anti-icing fluid, initial training on-site and recurrent training online.

Two TURBO XL Digital Meters on the unit accurately measure the anti-icing fluid sprayed from each gun. The pressurized system applies fluid with dual application guns with dual meters, ensuring even application on both wings and allowing crews to spray both wings simultaneously. This is possible through the unit's reliable Eagle compressor which produces enough force to treat both wings at the same time. "You could even have one mechanic spraying one wing, and another spraying the other wing, and the application would be the same on both sides," Randa says. "There is nothing

out there right now that has any of these features."

The Wing Armor system offers a low profile that enables it to fit underneath the wings of most business jets. The unit, which weighs less than 1,000 pounds when full of fluid, also features a tow bar so that it can be hooked up to a tug and moved around. A vertical lock stows the tow bar when it's not in use. Its large tubeless tires make it easy for operators to maneuver the cart inside a hangar. The system's wide 2-inch

**"They have the wrong understanding that they can put the [anti-icing] fluid on and push the airplane out at any time."**

**Walter Randa, CEO,  
Leading Edge Deicing Specialists  
and Wing Armor**

filler neck accepts large filling hoses, and a brass ball valve provides extra safety when the filler cap needs to be removed.

The rust-free, 60-gallon stainless-steel tank protects anti-icing fluid from any degradation and is compatible with all fluid types (II, III and IV).

Randa prides himself on how user-friendly and intuitive the system is to use. "The control panel on the unit makes it so simple to use," he says. "There is an on-off switch, a toggle switch that determines the spray mode, and an emergency stop button. There are also two pressure gauges on the panel that show the operator at a glance that the system is functioning properly."

Randa sees two major markets for the Wing Armor system: FBOs and corporate operators with their own hangars. The main thing the Wing Armor provides is convenience, safety, efficiency and cost savings, all things FBOs and corporate operators can use. ✈️

## About the author:

*Walter Randa, founder of Leading Edge Deicing Specialists, is a graduate of Aviation High School in Long Island City. He also attended courses at the Academy of Aeronautics at LaGuardia Airport. Randa spent the last 31 years in airline operations. In 1992, Randa began his career in ramp air operations and as a safety trainer for UPS in Montreal, Canada, once he was certified to deicing. The move north gave Randa an introduction to Canada's cold winters and aircraft de/anti-icing. Randa has specialized in providing Aircraft Surface Contamination training to ground crews since 1992 and created a program for flight crews in 1997. Randa is an accredited IS-BAO auditor and a member of the SAE G-12 Aircraft Ground Deicing committee. Randa's passion is flying and he holds a commercial, multi-engine and instrument rating from the Flight Safety Academy in Vero Beach, Fla.*



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## Deicing Training Solution Leading Edge Deicing Specialists

Leading Edge is a professional training enterprise dedicated to promoting "The Clean Aircraft Concept" within the aviation industry. It offers flight, maintenance and ramp crews a solution when they require ground icing safety training. The "Fly Clean, Fly Safe" program was designed to emphasize the use of standardized aircraft de/anti-icing methods and procedures, which are essential elements in maintaining safe operations. Over the last 15 years, Leading Edge seminars have been presented in the U.S. and Canada in association with NATA, NBAA, CBAA, CCAA, COFA, and directly for airlines, corporate customers, the military and FBOs. Its full and half day courses are FAA IA approved and recognized by Transport Canada.

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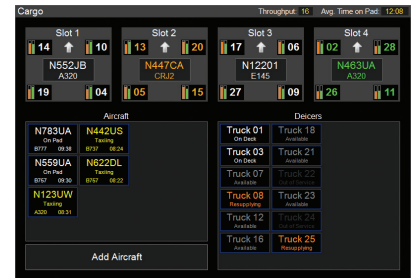


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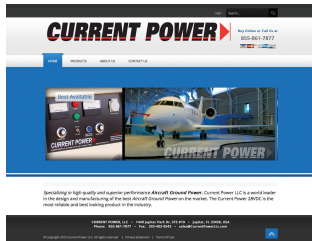
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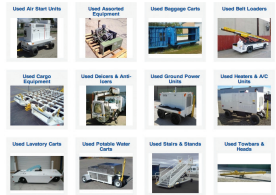


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## Accurate Data Entry Is Indeed Requisite To Successful Quality Management

*Maintenance organizations of all kinds make decisions and service customers based on the data they have at their disposal. For those decisions to make sense, the data used to make them needs to be accurate.*

By Will Ryder

In April's edition of *Ground Support Worldwide* I remarked upon the relevance of engaging with customers to understand of how they run their business and learn how they measure quality of service. This month's article focuses on the relevance of accurate data as a key contributor to the success of a maintenance organization's quality management system (QMS).

The International Organization for Standardization (ISO) best describes all the characteristics and requirements of a QMS. Simply put (and slightly paraphrased), a QMS is an enabler which gives an organization a better ability to "...identify, measure, control and improve the various core business processes". If your organization is serious about using a QMS to satisfy customers and you have a role or responsibility than you're going to need timely and accurate data to accomplish all of that.

We can agree on the premise that it is difficult to place a definitive value on the quality of data that a company uses. Anyone involved in measuring and managing based on key performance indicators (KPIs) will undoubtedly tell you that timely and accurate data is an invaluable intangible asset.

According to sources, "A majority of organizations use only a fraction of their enterprise information to gain the kind of actionable insight needed to facilitate superior business performance". Admittedly I've been associated in the past with maintenance organizations that have well-trained mechanics, use proven work methods and well-written procedures, and yet they struggle in terms of timely and accurate data entry. Resultantly there

is failure in the ability to effectively utilize any form of process-based QMS to improve business performance and customer satisfaction.

### Case for Better Data

Maintenance organizations of all kinds make decisions and service customers based on the data they have at their disposal. The crux of that data comes from the mechanics; whether it be in the form of putting pen to paper to document their work or direct data entry into a maintenance management system.

Translating mechanic effort into accurate data requires discipline. Very few fleet maintenance mechanics that I know of started out with a clear understanding of how to properly document their efforts, or fully appreciate the bearing that their "paperwork" (i.e. data entry) has on an organization's ability to measure quality of service to its customers. Therefore, as part of a QMS mechanics must be trained how to complete their paperwork and must be held accountable for the accuracy of data entry.

Quality assurance is achieved by the maintenance organization when steps are incorporated into the maintenance procedures that require the mechanic doing the work to accurately document their efforts, and the person supervis-

ing the work approves the quality of workmanship as well as the associated documentation and data entry. These measures also allow for a strong partnership to exist between the shop and the business unit(s) that govern the data and that are ultimately responsible for establishing the business rules or procedures.

Quality assurance of data is also a prerequisite to 'quality control'. Essential to quality control is the review data for routine reappraisal of the effectiveness of an organization to meet customer requirements. This involves taking time and discipline to go back at the completion of work and routinely review baseline readings for condition monitoring of quality of service. Steps can then be taken for changing the focus from just getting baseline readings to quality control of the work being done.

Don't underestimate the value of accurate data. Those organizations that train and hold mechanics accountable for the accuracy of their paperwork and routinely review the data are in a much better position to satisfy a customer than those that don't. ✈️

### About the author:

Will Ryder is Global Aviation Services' director of maintenance for the company's West Region. His experience includes 24 years in fleet maintenance and GSE support leadership. Global Aviation Services provides GSE and fleet maintenance service to the aviation industry and has more than 180 technicians serving more than 50 airports.



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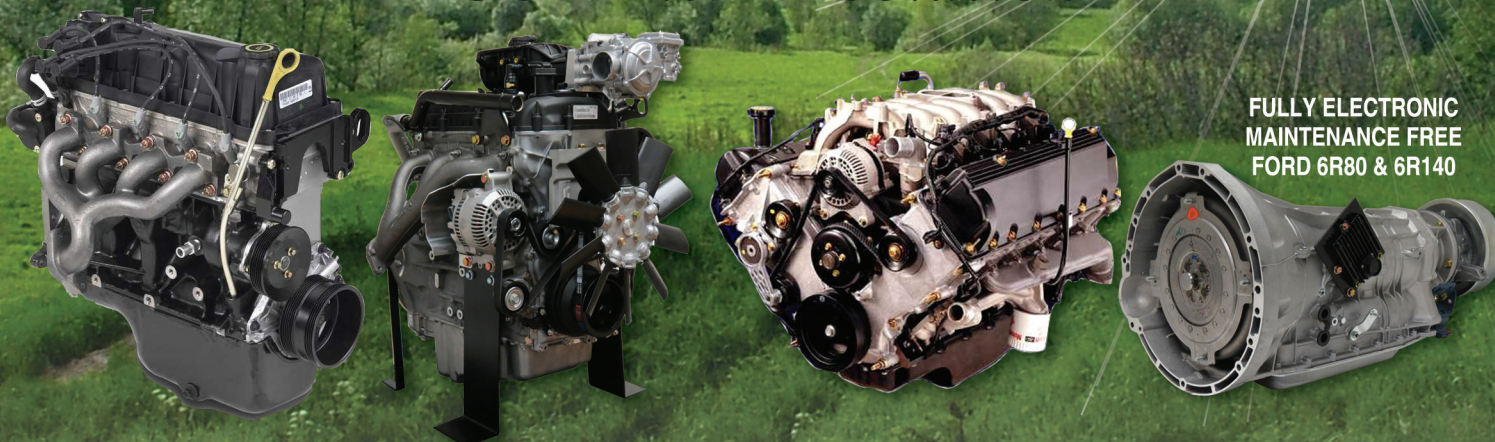
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