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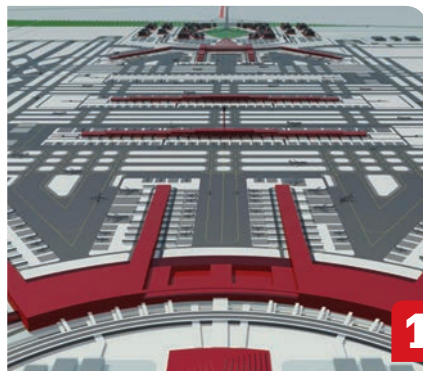
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Major Events in 2013



Asian Business Aviation Conference & Exhibition
Shanghai, China



GSE Buyers Conference
Lisbon, Portugal



IATA Ground Handling Conference
Vancouver, Canada

Business Buzz

Goldhofer buys SCHOPF: On Jan. 1, 2013, Goldhofer Aktiengesellschaft took over the SCHOPF group. The group includes SCHOPF Maschinenbau GmbH and SCHOPF ROFAN GmbH, which together have a workforce of about 160 employees.

Swissport reports 2012 sales: Swissport International Ltd. reported total revenue of \$2.03 billion last year, an increase of 10 percent compared to 2011. The results included the acquisition of the former Flightcare operations in Spain and Belgium. The company's growth was mainly organic and resulted from larger contract wins at important European airports, such as Paris Charles-de-Gaulle, Copenhagen and London-Gatwick airports.

Labor unrest for Iberia: Striking ground workers and flight attendants for Iberia clashed with riot police officers at Madrid-Barajas Airport last month at the start of three weeks of

work stoppages intended to protest a plan to eliminate more than 3,800 jobs. Pilots are expected to join the strikes this month.

Boeing recognition: HBD/Thermoid, Inc. received a 2012 Boeing Performance Excellence Award. The Boeing Company issues the award annually to recognize suppliers who have achieved superior performance. HBD/Thermoid, Inc. is one of only 441 suppliers to receive the Silver Level Award.

Baggage handling record: The nation's largest airlines reported their lowest rate of mishandled baggage for a year during 2012, and set high marks for on-time performance, the fewest long tarmac delays and a low rate of canceled flights.

Proposed lithium ban: The International Civil Aviation Organization's dangerous goods committee has proposed revoking an exemption that permits lithium ion aircraft batteries as heavy as 77 pounds to be shipped on passenger planes.

EU approval: Green energy company ITM Power secured European Union approval for fuel cells to power baggage handling equipment. The company specializes in developing equipment that stores energy from renewable sources by using it to generate hydrogen.

Pennies in profits: The 10 largest U.S.-based airlines

earned a combined \$152 million in profits in 2012, according to a report from Airlines for America. That represents 21 cents of profit for every passenger who boarded a plane in the year, or a margin of 0.1 percent. The trade group blamed the razor-thin margin in 2012 on an increase in maintenance material, fuel and labor, among other costs. The price of jet fuel reached a record-setting, yearlong average of \$128 per barrel. Fuel now represents as much as 49 percent of total operating costs for the airlines.

Delta refines ND crude: Delta Air Lines received its first shipment of North Dakota crude oil at the Pennsylvania refinery it purchased to produce its own jet fuel. Jet fuel is Delta's largest expense, and it hopes to save \$300 million annually by producing its own using more domestic crude oil instead of foreign oil.

Record numbers for DC airports: More than 42 million passengers traveled through Washington-area airports in 2012, according to the Metropolitan Washington Airports Authority. Reagan National Airport posted an annual record of 19.7 million passengers, a 4.1 percent increase from 2011, and well above the 1 percent average growth rate nationally. Dulles International Airport sent 6.7 million travelers to their destinations, and the number of international flights out of the Northern Virginia airport increased for the ninth straight year.

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'It's a miracle': *The Wall Street Journal* reported that airports across the country say more able-bodied travelers have figured out they can use wheelchairs for convenience, making waits a lot longer for travelers with genuine needs. At Los Angeles International Airport, airlines and companies that provide wheelchair service estimate 15 percent of all requests are phony, said

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Lawrence Rolon, coordinator for disabled services for Los Angeles World Airports. Airport officials estimate nearly 300 wheelchair requests a day are bogus.

New Deals

Swissport to hire 1,000: Swissport USA plans to hire 1,000 New Jersey residents for available positions with the aviation ground services company at Newark Liberty International Airport as it opens a new cargo and baggage handling operation this April. Swissport asked the New Jersey Department of Labor and Workforce Development to help fill the positions, giving priority consideration to people displaced by Superstorm Sandy and New Jersey's long-term unemployed, particularly those already involved in storm cleanup efforts through a National Emergency Grant.

Bridges for BOD: Adelte Airport Technologies will install two passenger boarding bridges at the Bordeaux-Merignac Airport. The French airport, which sees almost 4 million passengers each year, is updating its facilities to improve both traveler experience and aircraft services.

Operations at BJV, DLM: Turkish Ground Services, which celebrated the handling of its millionth aircraft at the start of this year, is to expand its operation to Milas-Bodrum and Dalaman airports.

Authorized repair: JLG appointed Palmer Johnson Power Systems' Madison, WI, branch as an Authorized Ground Support Service Provider. The Madison branch is the fifth Palmer Johnson branch awarded the JLG status.

New Service: Valley International Airport, Harlingen, TX, is offering above- and below-wing, ground

handling service. The first airline to take advantage of the airport's ground handling service was Sun Country Airlines effective last October with Republic Airways following suit effective Jan. 1.

Catering award: Gategroup announced contracts totaling more than \$462 million over a three-year agreement with United Airlines. This award was part of a tender that covered the majority of United's contracts with the gategroup brand, Gate Gourmet.

People in the News



Michael Doane

retired from Douglas Equipment after 50 years with the com-

pany, including positions in engineering, sales and marketing. Doane joined the company in 1963 on a five-year engineering apprenticeship and in 1968 qualified as a production engineer.

Doane rose steadily through the ranks progressing from production engineer to senior design engineer from 1963 to 1973.

He then became technical sales engineer, rising to general sales manager in 1987 and became Douglas' sales and marketing director in 1988. Among his biggest achievements was the launch of a completely new product range of tow-barless aircraft-handling tractors, which became the global market leader in less than five years.

In 2010, Douglas achieved the rare accolade of winning two Queen's Awards for Enterprise in one year. It received the Queen's Award for Innovation for the Douglas RAM Handler which reduced the deck handling time for aircraft

from seven minutes to just 50 seconds. It was developed for the Royal Navy and subsequently marketed to other forces. And it also took the Queen's Award for International Trade.

Alexis Frantz joins Servair as head of strategy.

Betsy Bacon was named managing director of Alaska Air Cargo. Bacon previously served as director of cargo operations and compliance.

Captain **John Floyd** was appointed director of safety for Aloha Air Cargo.

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Electric GSE Buying Trends Report

How much electric GSE is out there? What goes into making a decision to purchase e-GSE? A readership survey finds steady percentages for electric across all types of equipment and suggests two reasons why readers aren't buying more.

By Steve Smith

About 10 percent of all ground support equipment is currently electric, and while the e-GSE share holds steadily across all types of ramp equipment, that share isn't likely to go up dramatically without a guarantee of better battery performance or an increase in funding to purchase the equipment.

That's what we learned after sending out a survey to a select group of *Ground Support Worldwide* readers last February.

Our reasons for conducting the survey were simple:

- To judge the current market for e-GSE,
- To see what future buying trends might be.

CURRENT MARKET

Our survey went out to a broad group of *Ground Support Worldwide* readers that included service providers, airlines, FBOs and airports. The majority (41 percent) were "ground handlers/service providers" and 82 percent indicated that they had direct or supervisory influence over purchasing new or used e-GSE.

Most of our respondents had less than \$100,000 as their 2013 budget to buy new or used e-GSE, with the rest ranging from \$101,000 to past \$1 million. The majority of respondents (65 percent) indicated they were not able to spend all of their e-GSE budget last year either because of outright budget cuts or that the money might be carried over to this year.

QUESTION: Taking your current total GSE inventory into account, what is the percentage represented by e-GSE?

10 percent or less	57 percent
Between 11-25 percent	23 percent
Between 26-50 percent	6 percent
Between 51-75 percent	6 percent
Between 76-100 percent	6 percent

Many survey respondents indicated that they did anticipate purchasing more new or used e-GSE over the next 10 years.



We wanted to judge when some of the first e-GSE was purchased, and we heard from readers who said they may have seen their first piece of e-GSE at some point in the late-1980s.

For our part, we dug up a news story that indicated American Airlines was the first carrier in the United States to replace all its fossil-fueled equipment with electric models at the El Paso International Airport. The story was dated 2001, but said that the airline started the push for electric equipment in 1996 and gave priority to airports in cities with severe air quality issues deemed “serious” non-attainment designations by the EPA. (Such designations later became one of the main reasons the FAA started the Voluntary Airport Low Emissions Program in 2004.)

We chose to go back 20 years, since 20 years ago readers would have been paging through the second issue of *GSE Today* (the former name of our publication.)

QUESTION: Has this overall percentage of e-GSE changed in the past 20 years?

Yes, by at least 10 percentage points. **32 percent**

Yes, but by less than 10 percent points. **21 percent**

No. The percentage has remained the same. **46 percent**

We also asked about product categories for e-GSE and received a fairly steady, equivalent 10 percent use of electric equipment for cargo, belt loaders, pushbacks/tugs and other service vehicles.

Finally, we asked readers to rank the importance of the following attributes when it came time to deciding which brand of new or used e-GSE to purchase. (We’ve only listed the “most important” tallies for this question.)

Battery performance	78 percent
Reliability	78 percent
Support	61 percent
Price	59 percent
Maintenance	59 percent
Total cost of ownership	52 percent
Availability	43 percent

FUTURE MARKET

If by the “future” we just measure the rest of 2013, the buying power for equipment seems to be there. When asked about budgets, most of the respondents (57 percent) said they had either “the same as 2012” or “more than 2012” to spend on purchasing new or used e-GSE.

If by the “future” we mean the next 10 years, the results are a mixed blessing. Yes, readers do anticipate purchasing more e-GSE across all product categories,



ries, but those yes votes don’t reach much past the 50 percent mark, with the votes for “less” or “the same,” of course, filling out practically an equal share.

QUESTION: Over the next 10 years, do you anticipate that you will purchase more, less or the same amount of new or used e-GSE for the following product categories?

Cargo:

More	50 percent
Less	21 percent
The same	29 percent

Belt loaders:

More	52 percent
Less	31 percent
The same	17 percent

Pushbacks:

More	41 percent
Less	41 percent
The same	18 percent

Tractors/Tugs:

More	40 percent
Less	13 percent
The same	29 percent

Service vehicles:

More	40 percent
Less	32 percent
The same	28 percent





What might be stopping readers from purchasing more e-GSE? While it's difficult to use statistics to determine individual motives, that's never stopped us in the past so here are a few answers worth considering:

- When asked whether they had directly used or been a participant of VALE funding and/or other sources of public

money to purchase e-GSE, a strong 75 percent of our respondents said "no."

- On the other hand, when asked if public funding were available that would allow, say, a ground handling service provider to directly purchase e-GSE, a resounding 73 percent said "yes."

So everyone likes "free." VALE isn't the only source of funds for e-GSE, but it is the best-known.

In fiscal year 2011, the FAA issued VALE grants for 12 projects at 11 airports for low-emission projects. Since 2005, the FAA has funded 52 low-emission projects at 30 airports representing a total investment of \$138 million (\$109 million in federal grants and \$29 million in local airport matching funds) in clean airport technology.

But there's another, maybe more troublesome, issue than funding that could be stopping or at least slowing down the purchase of more e-GSE.

QUESTION: What type of batteries power the majority of your e-GSE?

Rechargeable lead acid	86 percent
Lithium ion	14 percent

Then, when asked how satisfied they were with the performance of e-GSE, i.e., runtimes vs. downtimes for recharging, a little over a third (37 percent) of our

What other issues are important to you regarding electric ground support equipment?

We asked one open-ended question in our survey. Here are some of the responses:

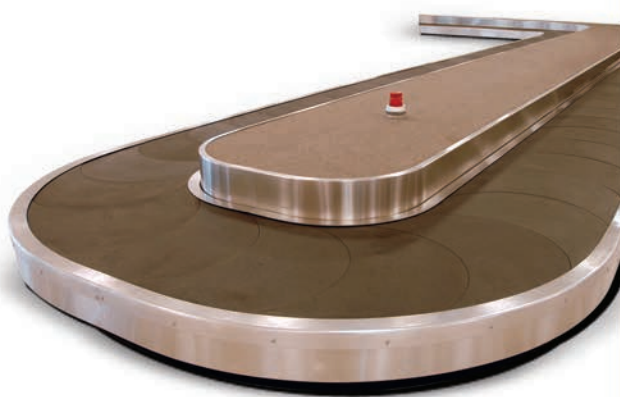
- "COST!"
- "Availability, after-sales support, maintenance and spare parts locally."
- "Airport support as far as charging stations and incentives to support change."
- "Battery performance in sub-freezing temperatures is a major concern."
- "Overall replacement cost of the equipment still remains way too high."

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Finally, our very last question was this:

QUESTION: Which one of the following statements most closely describes your opinion regarding the future of e-GSE?

- 1) E-GSE performs well within a mix of non-electric equipment, but it would take a huge change in battery performance for e-GSE to make up the majority of GSE inventory **60 percent**
- 2) The higher energy prices rise and the tougher environmental regulation get on non-electric power sources, the more likely I will choose e-GSE **27 percent**
- 3) E-GSE will never command a large share of the market since its first costs are higher than non-electric GSE **13 percent**

respondents said they were "satisfied" with almost as many (41 percent) that said they were "neutral." Couple that with one of the answers above that indicated how important battery performance is to purchasing decisions.



Taking all those answers into account for future purchases, we're led to believe that battery technology has to improve no matter how "free" sources of funding make the equipment out to be. Can lead acid technology do more? Or can lithium power come down in price? And what about the matter of funding overall? We'll talk more about these matters in our next issue. ✈️



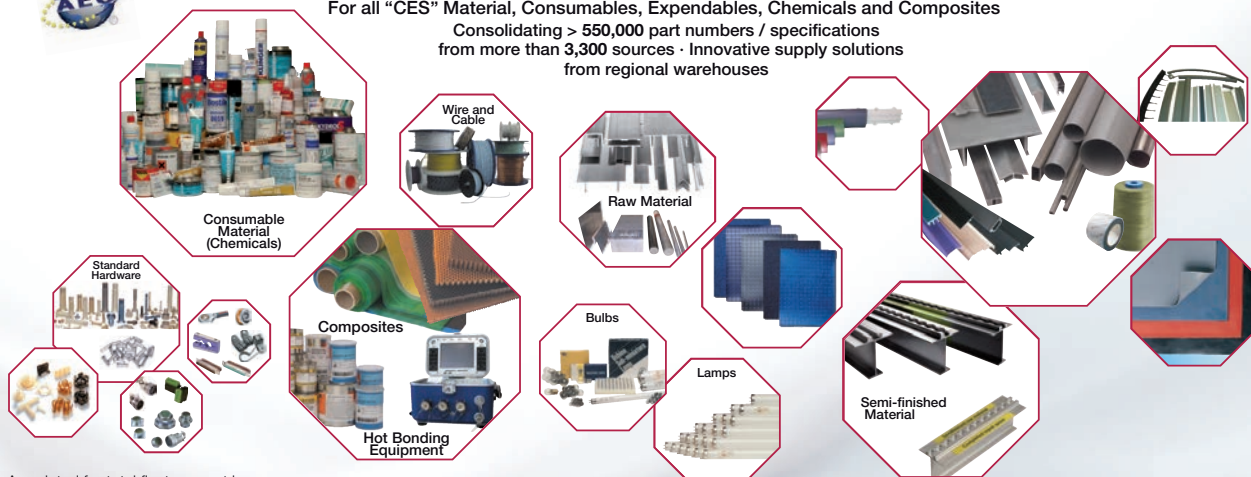
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GSE With 'Chinese Characteristics'

Say what you will about the Chinese government, it sure knows how to make the planes run on time.

By Steve Smith

Over the next few years, China plans to invest a quarter of a trillion dollars to turn itself into an aviation superpower. The country hosts more than two-thirds of the airports now under construction around the world with plans to expand 91 of 175 current facilities and to build 56 airports from the ground up.

Any description of the country's plans will typically point straight up:

- According to the International Air Transport Association, 296 million passengers and 11 million metric tons of freight traveled to, within and from China on aircraft.
- Based on current trends, the domestic Chinese market alone for air travel is expected to double in size about every eight years.
- Beijing's Capital International Airport is the second busiest in the world. But only about 15 million passengers separate it from the world's busiest, Hartsfield-Jackson Atlanta International Airport.
- In 2010 the world's three largest cargo airports were Hong Kong International; Memphis International (home to FedEx); and Shanghai Pudong International – with traffic up 20 percent from the year before at Hong Kong and Shanghai versus a 6 percent increase at Memphis.
- It will be the biggest growth market for Boeing and Airbus, though China is investing heavily in developing home-grown rivals in the hope of dominating the aviation markets of the 21st century.

But as expansive as China's aviation market may seem, it's still a veritable baby in the crib and starts out well behind the United States and the rest of the developed world:

- The country's commercial airline fleet numbered about 2,600 in 2010, half as



The Beijing Capital International Airport was about one year old when this picture was taken in 1959. The airport stayed very much the same until 1980.

THEN NOW



The Beijing Capital International Airport is currently the world's second busiest airport. The city will have a second international airport completed by 2018.

many as America's number, but with a population four times as large.

- The United States has more than 1,000 airports available for commercial aviation and 4,000 airports for general aviation and corporate jets. China, meanwhile, operates 175 airports and since, technically, the air space belongs to the military, it has limited general aviation or private jet traffic.

GSE IN CHINA

No matter how far behind they may start, the Chinese have a habit of catching up quickly and decidedly in their own particular fashion. When the government first began its economic reforms in 1980s, it did so with "Chinese characteristics," meaning adopting Western business standards, but in a distinctly Chinese way.

To help us understand these characteristics for the Chinese aviation market

in general and the GSE market in particular, we talked with Francis Chao, a Taiwanese-American consultant, who runs Uniworld, a marketing firm in Pittsburgh, CA, and who spoke about the market at our AviationPros LIVE event held earlier this month in Las Vegas.

"Everything is happening very, very fast in China," Chao says. "No one knows exactly what the Chinese are doing and they're not talking."

Chao's been doing his part to find out what's going on in China and to get people talking since the late-1990s when he sensed that the aviation market could soar in China.

At the time, Chao was working for the U.S. Department of Defense, FAA and other agencies as a contractor offering interpretation and other support services in dealing with businesses in Hong Kong, Taiwan and China.

Chao initially put his energies into promoting general aviation in China and decided he could play a role fostering re-

lationships between China's emerging aviation industry with established commercial counterparts in the United States:

- In 1998, he published the first edition of the quarterly Chinese-English *China Civil Aviation Report*, "We started out just copying pages with an office copier," he says. "And now it's a full-color magazine."

Nothing stands in the way of the fact that the Chinese can build more of most anything at a lower cost.

- In 2001, he started organizing an annual forum on general aviation that included Western industries and their Chinese counterparts to discuss aviation's future in China.

- Also in 2001, he made his first trip to the Experimental Aircraft Association's popular AirVenture show in Oshkosh, WI, escorting a delegation

from the Civil Aviation Administration of China as part of an FAA project. He also produced and distributed 40,000 copies of a 130-page guide printed in Chinese called "What Is General Aviation?" In this case, Chao borrowed an idea from the General Aviation Manufacturers Association, which published a similar guide 40 years ago to promote

general aviation in the United States.

Much of the promotion certainly had an impact. Earlier last year, the Chinese government announced that it would open up its skies – or at least that part that rises 1,000 meters above sea level – to general aviation.

As for commercial aviation, Chao says its overall capacity is currently only at 30

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percent of America's capacity.

"There are going to be a lot more airports," he says, "and those airports are going to need a lot more equipment."

We first met Chao in the pages of "China Airborne," a book published last year by journalist and instrument-rated pilot James Fallows. In the book, Fallows chronicles China's ambitious aviation plans and describes Chao as the consummate middleman who becomes an indispensable guide to anyone from the West looking to navigate Chinese culture and business.

"On one side are international companies large or small who sense that somehow that have to 'get into' China because of its vast potential," writes Fallows in his book. "On the other side are the complexities, confusion and constant changes of customers and operating rules on the Chinese side."

Our first thought was that electric equipment could be a trend for GSE in China, considering the recent headlines

we'd read about how bad air pollution is in China. But Chao wouldn't hear any of it.

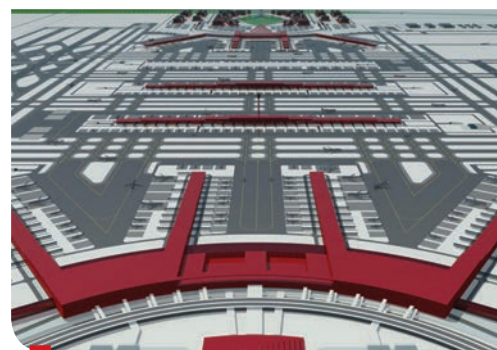
"I read news about Chinese aviation all the time," he says, "and some parts I may not agree with. But I never read anything about electric equipment whether by the government offering a subsidy to purchase it or through enacting regulations that it has to be used."

And while air pollution is certainly a factor in the country's large cities, the smog can't be blamed on the country's relatively small numbers of airports.

Chao reiterates much of what we've heard about the country's politics – that growth is the main source of legitimacy for China's current rulers.

"Buying electric GSE will not make anyone any money necessarily and everyone is only interested right now in buying equipment that will generate revenue," Chao advises.

As for selling GSE with Chinese characteristics, Chao offered two broad strokes of advice:



Beijing's newest airport lacks an official name and is currently known as "Daxing," which means "second." When it is finished in 2018, the airport will serve 130 million passengers each year. In comparison, New York's three airports (LaGuardia, JFK, and Newark) have a combined capacity of 110 million.

PHOTO: NACO

- **Partner Up:** GSE is not so sophisticated that it can't be – to use Chao's choice of two words – "copied" or "borrowed."

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"Once the Chinese learn how to make something," Chao explains, "it's 'Thank you very much, but we don't need you any longer.'"

When Chao first began consulting, there was an imaginary line running somewhere between China and his clients, which were typically operating facilities anywhere, but inside China.

But as the country modernized and began moving past simply operating factories on Chinese soil for the export of low-cost consumer goods, the Chinese government began to put pressure on manufacturers to operate in China.

Airbus, for example, set up its only plant outside Europe in Tianjin to assemble most of the planes China has agreed to buy. GE shares engine technology with a subsidiary of the Chinese Aircraft Corporation of China in order to supply engines to China's own narrow-body jet. General aviation manufacturers have also set up production plants in China - and China made headlines in 2011 for buying Cirrus for \$210 million.

Once the Chinese learn how to make something, however, it's likely to be another game entirely.

Nothing stands in the way of the fact that the Chinese can build more of most anything at a lower cost (although not necessarily better, Chao adds) with a naturally bigger share sold to its own home market. The scale of such a large domestic market can lead to exports around the world. And from that point, it's all China's gain.

For the moment, the pressure to build inside China isn't all political, of course.

"With a relatively small country like Taiwan," Chao says, "you can make product elsewhere and sell it there. But China is such a large country geographically that it only makes economic sense to build or assemble in China when you factor in the extra cost of shipping, duty fees and other transaction costs of importing."

▪ **Be A Landlord:** Land is "free" in China if only because the government owns and controls this resource. As a result, this free commodity becomes very valuable indeed.


Chao recommends that Western manufacturers claim some land without worrying too much about running a profitable venture - at least not initially.

"If you are going to wait until the market is developed for your product, it will be too late," Chao says. "Someone will already be in front of you who has land to build a factory."

And while the implications are unsavory, Chao also says that so keen is the government on growth that aviation is the only excuse for taking collectively

owned land away from the owners - in plain English, that means kicking the farmer off his plot. Between 2006 and 2010, local authorities did just that opening up rural land the size of New Jersey to new development.

"Land is the most important thing," he adds. ✈️



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The award-winning video, "Grounded," is a fictional story about a fatigued manager. Available on the Web site, on DVD and even on YouTube, FAA has lost count of the number of viewers. PHOTO: FAA

Are You Using FAA Human Factors Products?

The FAA has more human factors materials than any other source worldwide.

By Dr. Bill Johnson, Federal Aviation Administration

The FAA has created a variety of products and tools to address human factors within your organization. These tools have high potential to reduce errors, aircraft damage and employee injuries. The tools help ensure continuing efficient delivery of ground support services.

To determine if you are taking advantage of these FAA products you can answer yes or no to the questions below. Become a "yes man" to using FAA human factors information.

Have you visited mxfatigue.com or faasafety.gov?

All of the FAA human factors products are available at the shortened Web site address: mxfatigue.com. If you have not been there, you are missing out on a

number of free, high value human factors resources.

Another great source of information is www.faasafety.gov. Maintained by the FAA Safety Team, this site offers many online courses, access to CDs and information about safety events in your area.

Are you using FAA human factors training materials?

There are plenty of widely used FAA human factors training products. The Main-

tenance Human Factors Presentation System (MHFPS) offers 150 PowerPoint slides, 12 short videos, and 50 animated files that can comprise an entire human factors training program to be delivered by your instructor. Many human factors training consultants have adopted the FAA human factors training materials. You may be using it without even knowing its origin. Since 2008, the FAA has sent out more than 12,000 MHFPS in response to individual email requests from the human factors Web site.

The FAA Fatigue Awareness Training is an interactive Web-based training program. Average time to complete the fatigue awareness training is about two hours. It includes an online end-of-course test and will issue a completion certificate. Most users have taken the training via the Web, but many organizations worldwide have loaded the training directly onto their corporate Web sites.



All of the FAA human factors products are available at the shortened Web site address: mxfatigue.com. If you have not been there, you are missing out on a number of free, high value human factors resources.

PHOTO: FAA

The award-winning video, "Grounded," is a fictional story about a fatigued manager. Available on the Web site, on DVD and even on YouTube, FAA has lost count of the number of viewers. It is integrated with the fatigue countermeasure training.

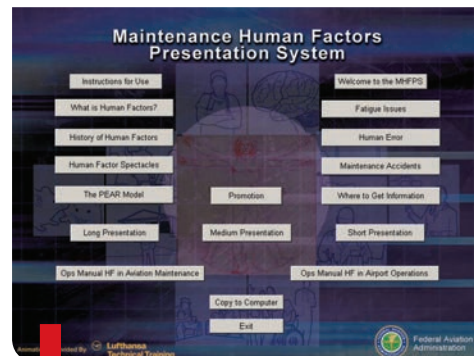
In 2011 and 2012 an estimated 20,000 visitors went to www.faasafety.gov and completed the fatigue training.

Are you using the human factors support materials?

Training is a key ingredient that affects an employee's knowledge and behavior. But training is not enough. Training must be reinforced with other organizational programs and promotions. FAA has put together some products that can help.

The mxfatigue.com has a place to download or order a variety of support materials. For example, there are 12 posters to remind workers about fatigue. The posters are pdfs and ready to go to your local printer. For a few hundred dollars many organizations can produce a variety of colorful and informative posters throughout the organization.

The Web site has a sleep diary and instructions to help workers assess their own two-week sleep habits. In many cases this is a bold awakening (not a pun) to



The Maintenance Human Factors Presentation System offers 150 PowerPoint slides, 12 short videos and 50 animated files that can comprise an entire human factors training program to be delivered by your instructor.

PHOTO: FAA

the fact that one is sleep deprived. The guidance material tells the worker what to do about fatigue.

The online sleep assessment tool asks 10 questions, regarding sleep and work over a three-day period. The boo-math-

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If you could not say yes to all the questions, no problem. It is not too late to start. Go to mxfatigue.com and determine which products may work for you. Place your order and you can get started immediately. Become a "Yes Man/Person" when it comes to human factors in your organization.

fitness for duty. While this tool has been online for nearly a year, during 2013 FAA plans to simplify the input and the output advice to the user.

Have you used the guidance material?

Personnel and their managers are not excited about reading technical reports and materials. However, a research and development program certainly must document their activity. Some of that documentation may be a bit scientific. The current FAA team has worked hard to make all reports, newsletters and other publications as readable and practical as possible. It's all on the Web site. That site has more human factors materials than any other source worldwide. Nearly 10,000 users per month is testimony to the value of the site and the information therein.

Are you tracking errors?

Human factors issues are not the sole

purpose of voluntary reporting systems. But it is indisputable that human factors contribute to more than 80 percent of events. Voluntary reporting such as the FAA Aviation Safety Action Program (ASAP) helps individuals and organizations document the many small events that may be indicative of increasing risk. Such programs are an important part of a safety culture. Self-reports are often excused from company and/or FAA action. The FAA has worked hard to help ensure that event investigations document the human factors that may be contributing factors.

Have you tried to justify the costs of your safety interventions?

Human factors programs are historically the first places managers cut when budgets are tight. Today, however, enlightened managers recognize the financial cost and safety risk associated with human factors. Of course, the corporate financial managers often need a reminder.

The FAA formalized a process and created support tools to help managers to calculate a safety and financial return-on-investment for human factors interventions. During 2012, a number of organizations used the ROI software. (Available on the Web site, but also see "How To Prove The Value Of Safety," *Ground Support Worldwide*, October 2011.)

Some of the demonstrated returns were in the 1,000 percent-plus range. ROI software users have commented on the ease of use and the quality of the embedded instructions. No one felt that they needed an MBA to translate the financial process into easy estimates and calculations. ✈️

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About the author:



Dr. Bill Johnson is the chief scientific and technical advisor for Maintenance Human Factors at the FAA. He spent more than 25 years in the private sector as a scientist and engineering executive prior to joining the FAA.



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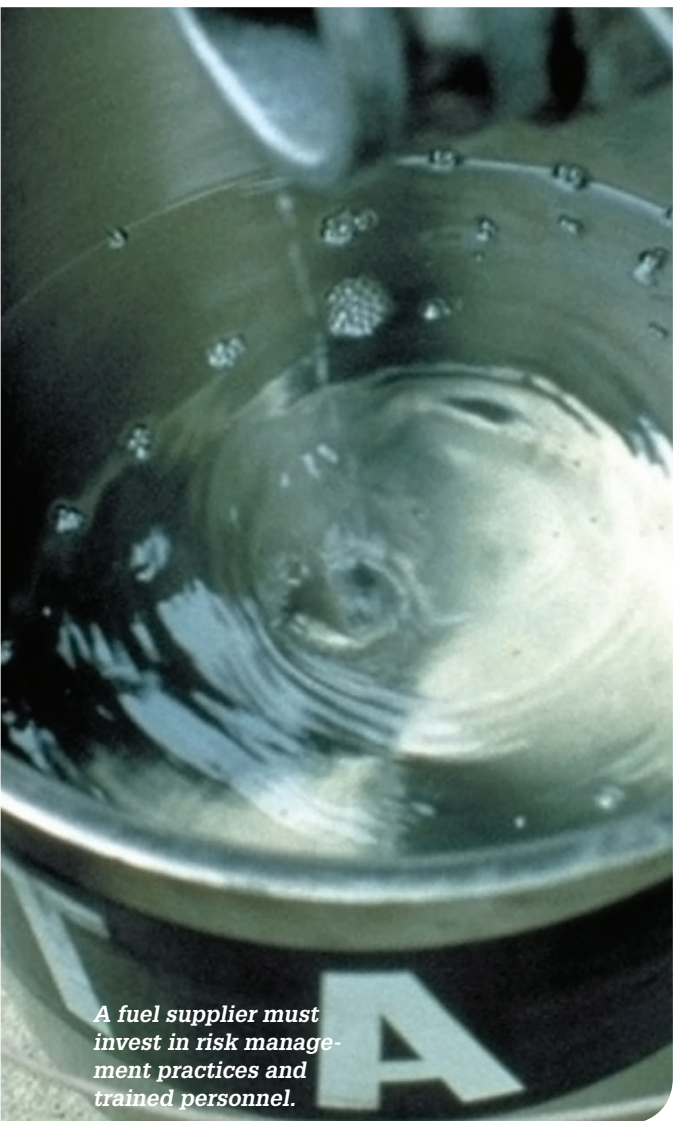
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A fuel supplier must invest in risk management practices and trained personnel.

Aviation's Hidden Threat

Casual fuel contamination undermines the safety of aircraft and passengers.

By Mike Mooney, VP & Chief Risk Officer, EPIC Aviation, LLC

I feel there is a hidden threat to the safety of aviation; it appears to me that some FBOs and fuel suppliers like to live in the past when it comes to risk management. I just hope they realize that in doing so it brings a tremendous amount of risk upon their customers, the aircraft they operate, the passengers and crews and ultimately upon their own organizations.

I am not sure if they live by the adage that "we have always done it that way and have never had a problem." Interestingly enough these are the exact same words uttered by people in the wake of some serious incidents; they just add one word at the end — "before."

On the other end of the spectrum are those who do it right. I have been in the aviation industry

for 34 years, and I have witnessed some superb examples of FBOs and fuel suppliers that have exceptional safety standards. One of those FBOs is Castle & Cooke Aviation at Paine Field in Everett, WA.

General manager Terry Wilcoxson has been in the business for decades, so I asked him about the old days and the practice of "free access" to the fuel farm. "The mailboxes were a dead giveaway," Terry recalls. This matched my own memory of my first day on the job as line manager and seeing these mailboxes at the large airport fuel farm used by the three different branded FBOs on the field. They were the typical rural mail boxes you see along country roads. Some had the red flag up. But that wasn't to signal the mailman that there was outgoing mail inside. No, that signaled the line personnel that



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they had received a load of fuel and the paperwork could be found inside the mailbox.

Free access meant that nobody from the FBO was conducting quality control (QC) checks and supervising the off-loading of the fuel. This sounds crazy given the industry standards and fire regulations that this practice violates today. However, I can tell you with certainty that some line personnel still meet the driver, take the paperwork, then walk away without checking the fuel (violation of ATA-103) or monitor the off-loading (violation of NFPA 407).

It is a recipe for disaster when you combine this practice with fuel suppliers who do not confirm that individual fuel delivery drivers are trained and certified in aviation fuel handling and do not require and confirm that only grade dedicated equipment is used to haul the fuel. This means that the truck and/or trailer are dedicated to hauling just avgas or jet fuel, not both and not other products. We don't even like trucks that have been steamed and dried preferring full-time grade dedicated equipment.

The airline fuel quality control standard followed by the airlines, the U.S. government and the military titled ATA-103 requires the use of grade dedicated equipment. ATA-103 is the industry standard applying to how aviation fuel should be handled.

QUALITY CONTROL

Educating FBOs on the importance of meeting or exceeding industry standards is incorporated into our annual onsite inspections of every branded location, our regional QC seminars and on our training Web site.

As a fuel supplier it is incumbent to invest in risk management practices and trained personnel. Some seem to be content to follow the practices of others in an effort to limit overhead costs. In fact carriers have recently expressed concern that many suppliers do not require grade dedicated equipment. This is a practice we adopted 10 years ago and believe it is vital to proper quality control practices.

Business 101 teaches us that responsible business conduct includes product quality, workplace health and safety, protection of the environment, protection of workers and compliance with laws

and industry standards. The first order of business for a smart opposing attorney in a lawsuit against a fuel supplier or FBO in the wake of a loss would be to educate the jury of the existence of some very detailed industry standards that apply to aviation fuel manufacture, transfer, storage and delivery into aircraft.

Noncompliance with our industry's standards brings tremendous risk.

It is due to incidents like the following that ATA-103 was modified to require grade dedicated equipment and therefore should be a fuel supplier's policy:

The QC training team was onsite at a dealer's location when a transport truck arrived to deliver a load of jet fuel.

They took the opportunity to use the

The airline fuel quality control standard followed by the airlines, the U.S. government and the military titled ATA-103 requires the use of grade dedicated equipment.



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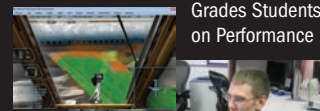


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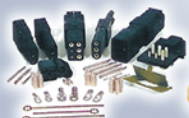
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delivery as a training exercise. During the visual inspection of the fuel they saw a brown scum lining the bucket. Multiple samples were drawn after wiping the bucket clean but the scum returned every time. They asked the delivery truck driver about the previous load. He indicated it was jet fuel. They asked what was on before that and again he indicated jet fuel.

Then they asked about the previous load to that and the driver admitted hauling biodiesel which contains FAME (fatty acid methyl esters). Further investigation revealed that the truck had hauled biodiesel, and then two separate loads of jet fuel from the supplier that does not require grade dedicated equipment to one of their branded FBOs that did not inspect the fuel before it was delivered. They refused the delivery before it was put into our FBO's tank. The FAA and aircraft engine manufacturers take FAME contamination very seriously.

CASUAL CONTAMINATION

Even the automotive industry is concerned about "casual" contamination. In a study released in September by the Battelle Memorial Institute sponsored by the Petroleum Equipment Institute (PEI), carry-over contamination of ethanol from transport trucks was sighted as a possible link in the severe and rapid corrosion caused by microbial growth that has been observed in systems storing and dispensing ultra-low sulfur diesel (ULSD) since 2007. (We'll post a link to the study in our online version of this feature.)

Untrained drivers are not aware of the risks associated with hauling aviation fuel. They don't know what they don't know. Clean trucks, residual fluids from previous loads and clean hoses are not a concern to them. Some drivers believe that all aviation fuel is the same and therefore it is OK to mix avgas and jet fuel.

Wilcoxson related another incident when a driver attempted to make a delivery, and he noticed that the driver was having a very difficult time wrestling with the delivery hose he was going to use.

"I grabbed the hose from the driver and it felt very heavy," relates Wilcox-



It's always easier and cheaper to run your business by ignoring industry standards. It's harder and more expensive to do it right.

son. "So I took the cap off the end and discovered the hose was full of automatic transmission fluid. It scares me to death to think of what could have happened if we had not discovered his mistake."

Wilcoxson knows that even the best of aviation fuel filters on tanks farms, refuelers and aircraft will not stop chemical contaminants.

We wonder if several different cases we have seen might somehow be related to "casual" contamination of fuel from the residue of previous loads when suppliers do not use grade dedicated delivery equipment. These include corrosion in aircraft wing tanks, gross amounts of microscopic particles in aircraft fuel filters and clear evidence of the effects of microbial growth.

I also wonder about aircraft operators who may have had to complete an engine hot section overhaul hundreds of hours before it was due caused by deposits in the engine. I know from experience that chemical contamination of aviation fuel can cause deposits in the hot section leading to cracking of components. One of our helicopter customers experienced this and determined the root cause was that his supplier had used delivery trucks that had previously hauled lube oils.

SAFETY FIRST

Training drivers of the important differences in handling aviation fuel takes time and resources, as does confirming that the individual driver is actually trained and that the trucks are grade

dedicated *before* the load is dispatched.

It's always easier and cheaper to run your business by ignoring industry standards. It's harder and more expensive to do it right. For example, at a time of limited carrier resources caused by natural disasters, refinery shutdowns, and market price spikes, just finding a truck and driver is tough enough, but doubly tough when you require they are aviation trained and the equipment grade dedicated. Short cuts and saving money do not go hand-in-hand with ensuring aviation safety.

Meeting all applicable industry standards and therefore operating within the law is the only way those entrusted with the safety of aircraft and passengers should operate. If you are in the aviation fuel business, you can't just talk about safety; talk the walk, and walk the talk. ✈️

About the author:



Michael Mooney began his aviation business career in 1978 and since that time has served a management role in aviation-related operations including, FBOs, airline ground support, into-plane fueling and a corporate flight department that operated a large fleet of aircraft.

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Three Reasons For Safe GSE Operation

The environment in which we work can be very dangerous at times. The correct attitude, safe work practices and attentiveness make all the difference between a good day and a very bad one.

By Kenneth DeVolpi and Jason Chapman, Matheson Flight Extenders

The proper use of ground support equipment and safe operating practices are absolutely vital for success and continued growth in our business. Here are three reasons why proper behavior while operating GSE is so important:

1 EMPLOYEE SAFETY

Every year, literally hundreds of people worldwide are injured, some critically, in GSE accidents. We don't hear about most of these accidents because they are not highly publicized. But we know they do happen.

The equipment we use is vitally important to the job we do on a daily basis. It can, however, be deadly, if used in a careless manner. Much of it is large and very heavy. It doesn't take much for what seems to be a small incident to cause a big injury or worse. We all have seen or maybe experienced an injury or an accident that was caused by carelessness with GSE equipment. People have lost body parts or lost their lives in our industry due to carelessness and improperly operating equipment.

The environment in which we work can also be very dangerous at times. The correct attitude, safe work practices and attentiveness make all the difference between a good day and a very bad one. No one wants to get hurt on the job or live with the guilt of causing a severe injury to a coworker.

2 EQUIPMENT DOWNTIME

When a piece of ground support equipment is broken due to negligence, abuse or horseplay, the loading operation must go on minus that piece of equipment. This makes the day's work harder and more stressful on everyone involved. Even worse, it could cause an aircraft delay. Believe us: If you get enough of those, you won't have to worry about being short on equipment anymore. You won't have a contract to use them on!

3 COST

Ground support equipment is very expensive, whether purchased new or otherwise. Many of the replacement parts needed for this equipment are specialized. They can only be procured from the equipment manufacturer. This naturally makes them expensive.

On top of this there are labor costs to consider. Good GSE technicians are in short supply. Many companies do not have enough of them on staff due to this shortage. This means there may be a backlog of broken equipment while the GSE technician struggles to catch up.

Because of this, an experienced and trained technician is paid pretty well. Imagine trying to work an operation to load an aircraft everyday with only half of your staff – you get the idea.



When a piece of ground support equipment is broken due to negligence, abuse or horseplay, the loading operation must go on minus that piece of equipment. That makes the day's work harder on everyone.

Let's pretend for a moment. You and your buddy are sitting on a running baggage tug. You rev the engine until the governor kicks in, and then slam it into gear. The tug jumps forward with the front wheels clawing at the sky. Pretty fun, right?

You do it a few more times and then something different happens. The tug jerks to a stop with a loud metallic clanking coming from under the rear of the machine. You tell your supervisor and he has the unit towed to the shop.

Within an hour the GSE mechanic has to tell the station manager that the rear axle assembly is shelled out. Almost none of the parts are reusable, so a new one must be purchased. The cost, you ask? A new Rockwell axle assembly runs several thousand dollars. Then you have the cost of labor and supplies to install it. So, you purchase the part, pay to have it shipped (it is heavy), and pay to have it installed all because someone thought it would be fun to pop some wheelies. After enough of these incidents, then the financial bottom line of the station is very negatively affected.



Let's all work together to ensure the continued success of our industry and ourselves by being safe, aware of our surroundings, and respectful of the resources our company has provided. Operating equipment in an unsafe manner can cause the equipment to have ongoing operation problems that will eventually end up destroying the equipment.

(This was written by two people, one in operations and the other in GSE. Both know the impact and the bottom line that this type of abuse can do to GSE.) ✈️

About the authors:



Kenneth DeVolpi, manager of sales and marketing and special projects manager, has worked for Matheson for more than three years and has been in the aviation industry for more than 20 years, including 15 years with Northwest Airlines.



Jason Chapman works in the company's GSE maintenance department and gained GSE mechanical experience with the U.S. Air Force and has worked in the commercial GSE industry for 12 years.

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No Spill Zone

Closed-loop fluid transfer systems protect the integrity of the fluid from the original container to the aircraft.

By Steve Smith

Bob Benson, founder and owner of US Mfg. & Design, White Bear Lake, MN, has been crafting fluid dispensing and fluid transfer solutions for the aviation industry even before starting the business in 1994.

"Our technology is a blend of simplicity with high-tech ingenuity," he says of his disabled-vet-owned business. "We know our products take a beating out on the flight line and need to work at all times."

Benson knows a thing or two about the flight line since he developed his original fluid transfer product while working as a senior engineer in advanced engineering for Northwest Airlines for six years.

"My job was to make the line more efficient," he says. One way Benson dreamed up was a better way to provide oil to aircraft. Typically, the maintenance crew reaches for one-quart cans. That tradition has its practical benefits: the cans are easy to store, last forever and mechanics always know the amount to add and record.

Benson, however, zeroed in a major drawback: contamination.

"The opening of the can is where problems can begin," he explains. "From simply opening up cans improperly, your entire system can be contaminated and this can lead to component failure."

Then there's the potential for spills and the cost associated with waste handling. In the late 1980s and early 1990s, the EPA clamped down on spills and waste handling.

As a result, there could be the following expenses once the can is opened:

- The possible contamination of the aircraft components due to metal fragmentation from opening the can with either a proper can opener or a screw driver.
- The potential of the maintenance person becoming injured opening the can.
- The contamination of aircraft components due to exposing the oil to the atmosphere.
- The contamination of the interior of the component exposed to atmospheric conditions due to the open fill cap on the aircraft.



The one-gallon, hand-operated dispensers.

- The hazard of spilled oil on the cowl interior, which could cause smoke or fire on the aircraft or the flight line.
- The expense of the maintenance person collecting the used cans and transporting them to a recycling center.
- The recycling personnel having to prepare the cans for draining.
- The expense of the cart to drain the used oil.
- The HazMat expense.

"Despite seeming like a huge nuisance," Benson adds, "it is actually an important problem because of the environmental impact and the potential fines which can bring tremendous expense to the airline industry."

While at Northwest, Benson sketched out a closed-loop system that could store larger quantities of oil in a contaminant-free plastic container that featured

A Second Life For Tires

Reusing tire casings reduces the amount of resources in the manufacturing process

The Commercial Specialty Tires business unit of Europe's leading automotive supplier Continental now offers a new eco-friendly tire called Continental LifeCycle.

By reusing selected tire casings the amount of energy and raw materials used in the tire manufacturing process are reduced – which also lowers the price of the product. With customers' help this large-scale recycling initiative will help to bring down the number of scrap tires needing disposal as well as the emission of climate-changing CO₂.

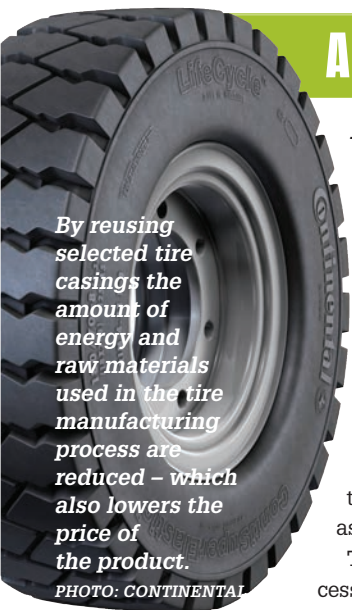
To ensure a smooth recycling and manufacturing process the Continental Commercial Specialty Tires Service

Center supports retailers in Germany and France in the selection and transportation of old tires.

The retreaded solid rubber LifeCycle tire is made from select casings which have passed Continental's exhaustive, standardized quality control.

Following these checks, the tread is removed from the casing and completely replaced, using a rubber mixture identical to the material of new tires. With this method, about 65 percent of the existing tire can be reused and only 35 percent of new raw material is needed.

All other phases in the ContiLifeCycle manufacturing process are identical to the production of all other new solid rubber tires at Continental. State-of-the-art tests



By reusing selected tire casings the amount of energy and raw materials used in the tire manufacturing process are reduced – which also lowers the price of the product.

PHOTO: CONTINENTAL



a quick disconnect coupler on the fill port to avoid particulate and chemical intrusion, and offered a better pumping system that could deliver the fluid.

"The quart can cannot go away," he says. "What I wanted to address is the mass dispensing of oil that requires multiple aircraft servicing in one session with a large volume of oil — an application that would require a large number of oil cans. There are other cost-effective and environmentally sound options available today, such as using a closed-containment system to transfer fluids from a bulk fluid container to an aircraft."

But by this time, Benson figured Northwest was in the business of moving people and not manufacturing new fluid transfer systems so he left the airline with its blessing and set out to make the system on his own.

In 1994, Fluid Transfer Systems was created to bring these products to the rest of the airlines and other industries. FTSI was a growing company with sales reaching over \$500,000 in 2001. But after 9/11, Benson had to close his doors due to lack of sales.

However, he came back later with US Mfg. & Design in 2007. His sales may have suffered, but his relationship within the aviation industry didn't.

"Customers bring new needs for USMDI to solve, and that gives us the opportunity for research and development that will create new products that can be marketed

to our customers," Benson says.

While his original products worked with 55-gallon drums, Benson has moved to smaller-sized fluid transfer systems that can store just 1-gallon of oil with a pump rated at 175 psi. Other new lines can hold 2-, 5- and 20-gallon of oil with some of the heavier sizes designed to be towed to the aircraft.

"Currently our goal is to become the leader of fluid handling products in the airlines and other industries that will protect the environment from all of their fluid handling," Benson adds. "Our products will provide better control of all fluids such as oil, fuel chemicals, etc.

The USMDI strategy is two-fold. One is to provide long-term employment for the people involved in the company. Two is to create many new products for all industries that apply to its systems.

"While having one market in hand, the penetration of new markets is a logical maneuver," Benson explains. "And spin-offs from this product line will come in

often, expanding our market potential."

USMDI is unique because it is a "virtual" business. This means that USMDI does not have to rent a large building space for offices nor does it have heavy capital equipment expenses. All of the production of major components is outsourced to local companies.

For example, USMDI uses local machines shops and molders for the production of its proprietary parts. The final assembly is handled currently in house until the sales volume increase. ✈️



US Mfg & Design Inc.'s newest line of fluid transfer systems is easy to carry and operate.

and quality controls combined with efficient and environmentally-friendly tire production ensure German quality products at a lower price.

As a tire manufacturer, Continental is seeking to minimize the use of environmentally harmful materials with a heavy carbon footprint. For example, Continental is currently taking part in a research project to examine the potential of Russian dandelions as an alternative source for natural rubber of rubber trees, potentially being used for all tire applications. This solution would significantly reduce the pressure on conventional rubber supplies. ✈️



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Tronair's new translucent tank made of cross-linked polyethylene material eliminates the possibility of hydraulic fluid contamination from rusting in steel reservoirs. The new nonferrous material allows technicians to see the fluid level in the chemical resistant reservoir. The new design is an example of the continuous effort by Tronair to improve existing products through innovation.

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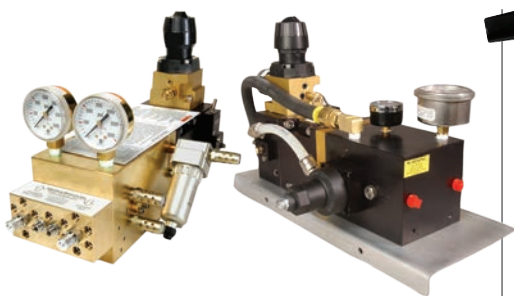


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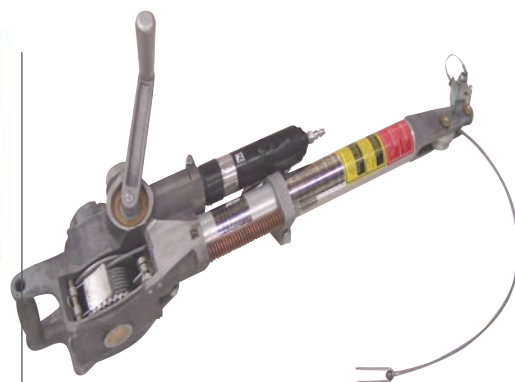
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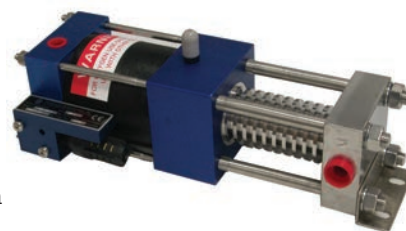



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Eagle TT-8 (8,000 lbs DBP)
United SML120 (12,000 lbs DBP)
Tiger TC-80, propane

AIR STARTS

TLD 270 PPM
TLD 150 PPM
Davco 100 PPM

BAGGAGE TRACTORS

Tug MA50, gas
Tug M1A60, gas
Harlan HTC 50, gas

DEICERS

Premier MT43D15, forced air
Global 2,200 gallon, open bucket
Global 2,100 gallon, closed bucket
FMC Tempest, open bucket

HEATERS

Trilectron 5050D

MAINTENANCE STANDS

B-4 stand - 37"-87"
B-5 stand - 88"-135"

GPU

TLD 90KVA, 120Kva & 140Kva
Trilectron 90 Kva
Hobart 60 Kva/28V dual output

CONVEYORS

NMC-Wollard TC-888, diesel
TLD NBL, diesel
Charlotte CBL 150D, diesel
Charlotte CBL 100E, electric
WASP A01771D, walk behind

LAVATORY TRUCK

NMC-Wollard TLS 770
Phoenix Metal TL 600 w/lift

PASSENGER STAIRS

Phoenix Metal PAS200 wide body
Clyde 15F2820 narrow body, towable

REFUELERS

Par-Kan 600 gallon trailer (gas + diesel)

AIR CONDITIONERS

TLD 802 115 ton w/heat
TLD 302 30 ton w/heat
Trilectron DAC200 - 20 ton w/heat
Davco AC20D w/heat & 28V GPU

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Steve Smith

GSE Diplomacy

Only Nixon could have gone to China and only air stairs could have gotten him off Air Force One.

By Steve Smith

In researching last month's cover story on GSE history and this month's China feature, we learned of an interesting story told by James Fallows in his 2012 book, "China Airborne."

Fallows, a journalist and instrument-rated pilot, chronicles China's soaring aviation ambitions in the book, and shares a story told to him by a man who served in the People's Liberation Army Air Force before immigrating to the United States in the 1980s.

"Nixon goes to China" serves now as both a description of the actual trip President Richard Nixon made in 1972 and a useful metaphor for describing how only someone with an unassailable reputation like the hard-line anti-Communist Nixon could make peaceful overtures to such a traditional enemy like China was in those days.

Before Nixon's trip, however, Henry Kissinger made a secret trip to Beijing to thaw out the cold war relationship between the two countries and set the stage for Nixon's arrival. Kissinger, then Nixon's national security advisor, would go undercover as just another passenger aboard a Boeing 707 operated by Pakistan International Airlines, which had operated scheduled service to China since the 1960s.

The 707, generally credited as ushering in the Jet Age, was one of the most recognizable planes in the world at the time. In fact, Nixon's Air Force One was none other than a 707.

But the Chinese authorities had one big problem. The 707 didn't normally fly into the People's Republic of China. The country relied on its own commercial and military fleet that used mainly Soviet-model aircraft.

And the movable air stairs the Beijing authorities had on hand didn't reach high enough for the 707.

"Would it have the right equipment to handle and service the plane?" Fallows writes. "At an even more basic and potentially embarrassing level, how was Kissinger supposed to get from the airplane onto the ground?"

The authorities couldn't buy or borrow air stairs from a Western supplier since this would reveal how out-of-date the country's airports were.

"Instead, they built their own in a rush," Fallows concludes, "using pictures and published specs of the 707."

When Kissinger's plane arrived, the new air stairs were rolled out just like at any other international airport ready to provide ground support for any type of aircraft.

So there you have it. One piece of GSE paves the way, ultimately, for the China we all know today.

Plus, it underscores many of the points raised by Francis Chao in our feature on China's aviation plans. Right now China needs outside vendors to ramp up its insatiable pursuit of all things modern. But only up to a certain point. Meanwhile, the country plans on being a builder selling to the aviation market rather than just another consumer.

And all because of one custom-made air stair.

A stylized, handwritten signature in black ink, likely belonging to Steve Smith.

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One of the Malabar rapid deployment jacks assembled and in use at a training exercise.

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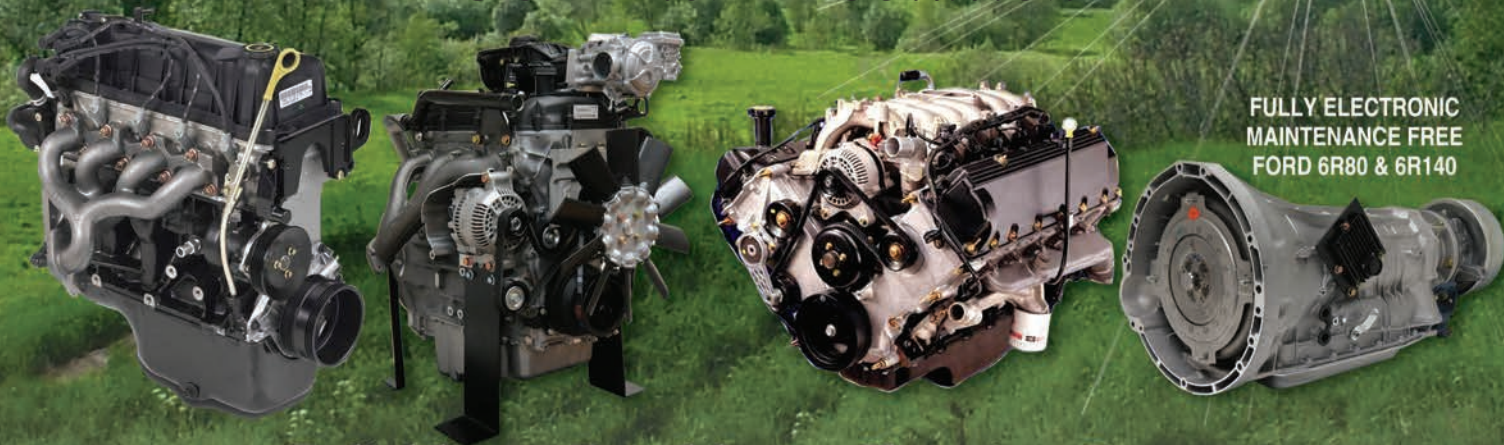
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