

SUPPORTING AVIATION FROM THE GROUND UP

# GROUND SUPPORT

## WORLDWIDE



### RAMPMASTER'S ENGINE MANAGEMENT SYSTEM: 2014 Ground Support Product Leader

Independent research confirms that a refueler truck outfitted with the EMS consumes up to 78 percent less in diesel fuel while delivering jet fuel.



### INTERNATIONAL

#### Global Baggage Delivery

#### Hits All-Time High

SITA reports baggage mishandling is lowest ever recorded Page 10

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ground service provider



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# CONTENTS



## COVER STORY

### 6 Rampmaster's Engine Management System: 2014 Ground Support Product Leader

Independent research confirms that a refueler truck outfitted with the EMS consumes up to 78 percent less in diesel fuel while delivering jet fuel.



19



14



26

## INTERNATIONAL/FEATURE

### 10 Global Baggage Delivery Hits All-time High

SITA reports baggage mishandling is lowest ever recorded.

### 14 How To Conduct Aircraft Refuel Servicing Operations

With flash and ignition temperatures at low levels, it becomes a matter of utmost importance to ensure that all aircraft fueling and fuel services are carried out in accordance with the highest standard of safety.

## DEPARTMENTS

### 4 In The News

### 22 Five Products We Saw At AviationPros LIVE

Two-day event also included the announcement of the winners of our annual Ground Support Leaders awards.

### 26 Product Hangar

### 33 Classified Advertising

### 34 Editor's Note

## COLUMNS

### 19 FOD: Three Letters That Can Spell Big Problems

## Major Events in 2014



**GSE Buyers & Ramp-Ops Conference**  
Dublin, Ireland



**27th IGHC Ground Handling Conference**  
Kuala Lumpur, Malaysia



**86th Annual AAAE Annual Conference & Exposition**  
San Antonio, TX

## Business Buzz

### Swissport International,

reported an 11 percent increase in revenue for 2013 compared to 2012. Main contributors to Swissport's growth were the full year impact of the Flightcare acquisition as well as new contract wins, including a multi-year contract with Etihad Cargo, a five-year Pan-European agreement signed with Germanwings, covering 11 countries.

### Matheson Flight Extenders Division

has grown by 20 percent with the addition of four new strategic metro area markets in less than four months, bringing the number of total markets served by MFE to 20 across the continental U.S. and Alaska. A new market in Sacramento, CA, was acquired when Evergreen EAGLE Aviation filed for bankruptcy last December. (Sacramento is also the national headquarters for Matheson Trucking, Inc. and the Matheson Flight Extenders Division.) The other three new markets were obtained during a federal government bidding process and include Tulsa, OK; Charleston, WV, and Orlando, FL.

### Aviation Safeguards

announced last month that a U.S. district judge threw out a lawsuit filed in July 2012 by several company workers and United Service Workers West, a local of the Service Employees International Union. The case accused company

managers of coercing their employees' choice of union representation before a majority of workers voted to terminate an SEIU contract in December 2011.

### Quintessentially Aviation Handling,

completed its new executive passenger and crew terminal facilities at Shannon Airport in Ireland. Quintessential Aviation Handling, which officially launched its new FBO at NBAA 2013 in Las Vegas, NV, is a part of the Quintessentially Group, a leader in global concierge services for ultra-high-net-worth individuals.

**LEKTRO, Inc.** delivered its 4,300<sup>th</sup> tug to Million Air YYC, in Calgary, Canada. LEKTRO's Executive Vice President Jesse Long personally visited YYC to deliver the all-electric vehicle. YYC is Million Air's newest FBO.

### Global Ground Support

has renewed the lease for its 112,000-square-

foot manufacturing facility in Olathe, KS. In addition, Global Ground Support expects to add 25 new jobs during the next five years.

**MCT Industries**, which manufactures custom trailers and aircraft ground-support equipment for commercial, military and government use, plans to more than double the size of its manufacturing facility in Bernalillo, NM. Town councilors approved \$5 million in industrial revenue bonds to help MCT construct and equip an 80,000-square-foot building to the east of the company's existing facility. As part of the expansion, MCT plans to add up to 40 new jobs.

**The Champion Company**, a diversified group of companies with expertise in chemical mixing and compounding, metal and plastic fabrication, automation, metal stamping and machining, electroplating and painting, unveiled the new brand identity for its special products division: Champion GSE. The name change

## Advertiser's Index

Advertiser	Page #	Advertiser	Page #	Advertiser	Page #
A T Juniper	30	Engine Distributors	36	Mercury GSE	32
ASIG	8	Flightcom	26	Mototok	5
Columbus Jack	12	Global Ground Support	27	Myslik, Inc.	23
Current Power	32	Hydraulics Intl	25	Par-Kan	29
David Clark Company	9	Lektro	30	PF Fishpole Hoists	31
Eartec	31	Maxpro Companies	17	Phoenix Metal Corporation	28
				Premier Engineering & Manufacturing	11
				Rampmaster	18
				Rotorcraft	15
				U.S. Airmotive GSE	16
				Wasp	13



precedes an announcement for a new product for the company's Stronghold brand of ground support equipment

**Seattle-Tacoma International Airport** unveiled a new project that by the end of the year will provide nearly 600 charging stations for electric GSE. Alaska Airlines has taken the lead in this green opportunity with 204 electric vehicles (146 with Alaska, 58 with Horizon) in operation on the ground at Sea-Tac.

**United Airlines** is cracking down on passengers who drag oversized bags into the cabin. The crackdown on oversized bags is an effort to address what United says is one of the biggest gripes among its passengers: The overhead bins are so overstuffed with carry-on bags that the boarding process is often bogged down as fliers try to find space for their luggage.

## New Deals

**Signature Flight Support** acquired Metro Flight Services at Detroit Metropolitan Wayne County Airport. Metro Flight Services provides fueling, ground handling and FBO services to commercial airlines and business and general aviation operators. Post-acquisition, Signature will provide all FBO services and sister com-

pany, ASIG will continue to provide commercial fueling and ground handling services at DTW.

**ASIG** acquired the assets of Skytanking USA, Inc., an independent provider of aviation fuel services. Skytanking USA has more than 350 employees and owns more than 800 pieces of refueling-related assets. The company, which is headquartered in South Florida, has operations at 14 U.S. airports, six of which represent new markets for ASIG.

**Liquip** has successfully completed Phase 1 of its planned upgrade of its North Carolina manufacturing facility. The investment helps the firm reduce lead times and offer a broader range of refueling solutions for global aviation operators.

**JBT AeroTech** was awarded a contract valued in excess of \$5 million for the supply of gate equipment to O.R. Tambo International Airport in Johannesburg, South Africa. The contract with Airports Company South Africa includes the supply of Jetway® passenger boarding bridges as part of the airport's ongoing terminal infrastructure updates.

**Tronair** will provide ground test tools for aircraft maintenance of all RAT products of UTC Aerospace Systems and Hamilton Sundstrand

under the terms of the three-year exclusive licensing agreement.

## People

Daifuku ABH has announced today that it has made two additional key director appointments by adding **Christophe Ciccardini**



as technical director and **Mohammed Arshad**



as project director to the board of Daifuku Logan. Ciccardini will add considerably to Daifuku's expertise in Standard 3 Screening. Previously he was operations director for CXR Ltd/Rapiscan Systems Ltd, the global supplier of security inspection solutions, and heavily involved in the development of next generation screening machines to meet new EU wide Standard 3 legislation. Arshad will lead Daifuku Logan's worldwide delivery of BHS systems. A chartered engineer by profession, he has a proven track record in the introduction, growth and operation of project management teams that are able to deliver engineering turnkey programs and projects on a global scale.

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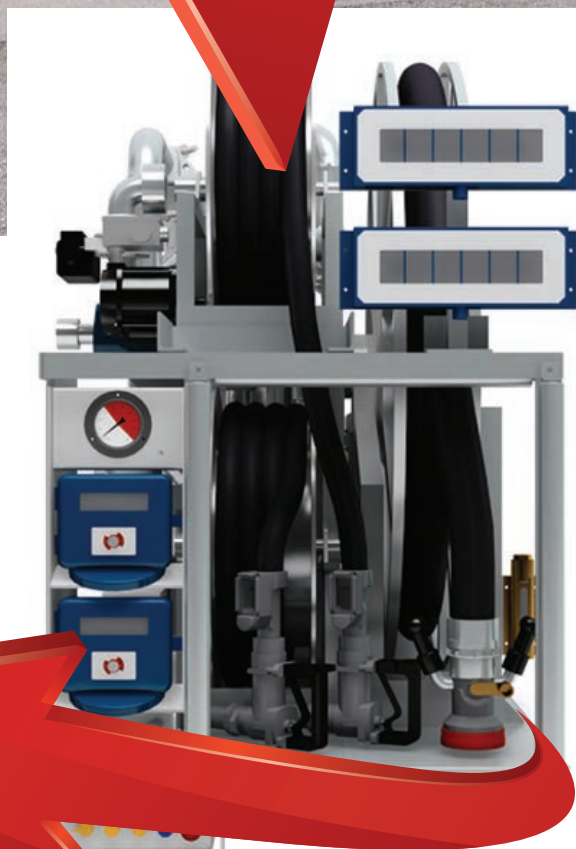
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## Rampmaster's Engine Management System: 2014 Ground Support Product Leader

*Independent research confirms that a refueler truck outfitted with the EMS consumes up to 78 percent less in diesel fuel while delivering jet fuel.*

*By Steve Smith*



# This year's Ground Support Product Leader award-winner is, at its most basic, a grey plastic box that isn't much bigger than a man's hand.

Visitors to Rampmaster's booth at AviationPros LIVE trade show held last month in Las Vegas might have paid more attention to the flow control and bypass servos, Venturis, primary valves, secondary valves, versa valves, pilot valves, regulators and sense lines also on display alongside this relatively small plastic box.

All those mechanical parts and pieces, however, are exactly what Rampmaster's patented Engine Management (Flow Control) System does away with and, in the process, saves money on fuel and wear and tear on the Rampmaster refueling trucks.

The typical refueler truck operator has to run the engine at high RPMs to pump the fuel while a bevy of mechanical devices and sensors regulate pressure to the wing. The programmed circuitry hidden inside the grey plastic box takes care of much of this operation and can produce the same pressure with less power.

"EMS gives operators the ability to control the flow of fuel in the fuel truck using the engine and eliminating the traditional parts we used to have in the system," says Kevin Ward, the company's vice president of marketing and sales. "By doing away with these we've done away with anything that would restrict the flow of the fuel."

As a result, the truck can deliver the optimum flow of fuel by running just off idle.

"Eliminating the restrictions of delivering fuel is the key," Ward says. Eliminating the restrictions means eliminating the need to raise the RPM of the truck's engine.

"It adds up to a big savings on fuel used in operations day to day, plus it adds to the longevity to the engine and drive train by not revving the RPMs to deliver fuel."

The technology was developed by Owen Watkins, Rampmaster's chief operating officer while he served as vice president of engineering and production.

"No longer does a fuel truck have to waste engine fuel by moving fuel around in a bypass loop while the engine stays at a high RPM," Watkins explains. "EMS allows the engine RPM to vary up and down depending on what the aircraft needs are."

While the product's innovation certainly went a long way toward earning

## Eliminating the restrictions of delivering fuel is the key

their year's Ground Support Leader award, Rampmaster sealed the deal when it took the added measure of obtaining third-party verification that the product did all that it promised.

### THIRD-PARTY TESTS

After introducing the EMS two years ago at our trade show and other industry events, the company hired West Virginia University's Center for Alternative Fuels, Engines and Emissions to put the product through a series of tests.

CAFE is a nonprofit research center well-known for its research measuring

## Rampmaster's Center for Product Innovation

The Engine Management System was the first project released from the company's Center for Product Innovation.

As the EMS was undergoing testing by West Virginia University's Center for Alternative Fuels, Engines and Emissions, Rampmaster was also developing another product innovation that it recently released.

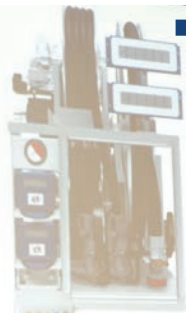
The Rampmaster Active Monitoring Program or RAMP, tracks refueler truck data throughout daily operations and provides customers with this information to better manage their operations.

#### Key Features

- Continuously monitor all trucks via two-way communications using onboard sensors and diagnostics.
- Alerts, dashboards, analytics accessibly via the Web on computer and mobile devices using cloud storage.
- Replaces traditional maintenance programs and monitoring with real-time information.



Ronnie Garrett

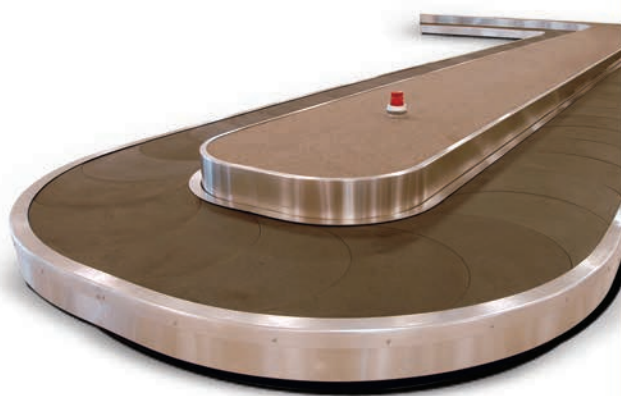


*Kevin Ward, vice president of marketing and sales for Rampmaster, accepts the company's Ground Support Leader award at last month's AviationPros LIVE trade show in Las Vegas.*

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Fleet Maintenance | Airport Equipment

## Company Timeline

Since its founding in 1968, Rampmaster has consistently delivered unprecedented product advancements that benefit customers' airport operations through longer refueler lifecycles, significant fuel and maintenance savings, lower EPA emissions and more.

**1968:** General Transervice, Inc. (GTI) is founded by Robert Watkins, a Vietnam U.S. Army Veteran, as an airport refueler maintenance company at Philadelphia Airport.

**1974:** GTI develops the Rampmaster – the first ever modular refueler. GTI sees the many challenges airlines face maintaining their refueling fleets. The Rampmaster modular design simplifies maintenance by allowing the truck to be separated from the fuel tank.

**1979:** The first Rampmaster prototype goes into service. This 8,000-gallon capacity model routinely pumped a million gallons per truck per month for Piedmont Airlines in Norfolk, VA, setting the new industry cost-per-gallon standard.

**1981:** Rampmaster sells out its production line – this year and every year since. The reliability of the Rampmaster became noticed immediately, creating a lasting demand-pull market for the revolutionary design.

**1988:** Rampmaster introduces its modular design in 3,000-, 5,000- and 7,000-gallon truck models. GTI incorporates the same modular straight truck design into units for the GA and FBO markets

**1990:** Rampmaster captures 80 percent of the domestic orders for heavy-duty refuelers. Rampmaster's success became evident – 8 out of every 10 trucks delivered were Rampmasters.

**1995:** Rampmaster unveils the world's first 15,000-gallon straight truck modular refueler.

**1997:** Outdoing their previous record, Rampmaster develops the 17,500-gallon straight truck refueler.

The world's largest non-articulating refueler captures 95 percent of the super heavy market segment.

**1997:** Rampmaster deliveries are made to South America and Japan. GTI's refuelers can also be found on ramps in Saudi Arabia, Kuwait, the Philippines and China.

**2005:** Rampmaster develops a custom 5,000 gallon refueler for the FBO market.

The trucks are an equipment career solution for forward thinking FBO management decision makers.

**2006:** Rampmaster unveils the 100% self-sustaining, 100% green hydrant cart. The unit never needs to be recharged or refueled, and creates zero EPA emissions.



exhaust emissions of both conventional and alternative-fueled engines. The center has conducted hundreds of research projects for fuel suppliers such as BP, engine manufacturers such as Cummins, vehicle manufacturers such as Ford and GM, federal agencies such as the Department of Energy and the Environmental Protection Agency and many other similar state agencies throughout the country.

In 2012, CAFEE traveled on-site to evaluate fuel consumption rates and emissions from three aircraft refueling vehicles at varying refueling rates:

- A 2005 5,000-gallon truck made by a Rampmaster competitor.
- A 2011 5,000-gallon Freightliner with a Rampmaster EMS.
- A 2011 10,000-gallon Crane Carrier Company vehicle, evaluated with and without the Rampmaster EMS.

Once the tests were finalized, the Rampmaster EMS did better than the company had hoped.

- The Rampmaster EMS, when employed on the 2011 CCC chassis, resulted in significant reductions in fuel consumption – from 45 percent up to 78 percent – per 10,000 gallons delivered at all refueling rates.
- A comparison of fuel consumption rates between the competitor’s truck and the 2011 Freightliner chassis equipped with the Rampmaster EMS also showed up to 43 percent reduction in fuel consumption delivered at all refueling rates.

In addition, according to the CAFEE report, “since carbon dioxide emissions

are directly correlated to fuel consumption, any reduction in fuel consumption or increase in fuel economy will result in a corresponding decrease in greenhouse gas emissions.”

“The savings in both diesel fuel and carbon emissions are unprecedented in the industry,” Watkins adds, “and we’re

proud to be the company that is delivering this game-changing innovation to the market.” ✈️



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## Potential Savings

Not only does the EMS lower a refueler’s fuel and maintenance costs, it also improves the simplicity and reliability of the entire refueler’s system:

According to independent testing performed by the West Virginia Center for Alternative Fuels, Engines & Emissions, operators may save on the following:

- Fuel Savings 43 Percent
- Emissions 63 Percent
- Engine Wear 46 Percent

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# Global Baggage Delivery Hits All-time High

By Steve Smith



*"The transformation in transfer bag performance over the past eight years has been helped by greater messaging reliability, enabling bags with short connection times to be identified before they arrive at the airport," the report states. "This allows 'runners' to be dispatched to the aircraft to find and separate out any 'short connect' bags."*

*SITA reports baggage mishandling is lowest ever recorded.*

**A**irline baggage delivery hit an all-time high in 2013, with the mishandling rate dropping more than 21 percent from 2012, according to air transport IT specialist, SITA.

The group's 10th annual SITA Baggage Report says that the rate of mishandled bags in 2013 was less than 7 bags per 1,000 passengers. This is just half the rate reported 10 years ago, despite a more than 65 percent increase in passenger numbers over the same period of time.

From 2012 to 2013, the rate of mishandled bags dropped 21 percent, and the total annual cost of mishandled bags to the industry fell nearly 20 percent. That puts the annual cost of mishandled bags at 50 percent less than in 2007, when the number of mishandled bags peaked at more than 18 bags per 1,000 passengers. The industry has achieved this improvement even as passenger numbers rose more than 5 percent in 2013 to top 3 billion passengers globally.

"The industry has joined together to tackle the problem of mishandled bags, and we have seen great results," said Francesco Violante, CEO, SITA, in prepared remarks. "There is still more work to do, but 2013 was the best year ever, showing the benefits of this collaboration."

More immediately, 2013 was another year of improvement for the largest cause of baggage snafus. SITA reports that while transfer bags continue to suffer the most baggage delays. In 2013, for example, they accounted for 45 percent of all delayed bags, but this was an improvement of the 48 percent seen in 2012 and continued the downward trend seen over the past six years when transfer bags represented well over half of all mishandled baggage.

"A large part of the improvement in handling transfer baggage is down to

greater messaging reliability and better segregation of bags with short connection times, as well as the introduction of early bag stores and smart mobile device for key operational staff," Violante writes in the preface of the report.

## PROGRESS MADE

Annual mishandled bags cost the industry a total of \$2.09 billion in 2013, according to the report. But that's an almost 20 percent reduction from 2012, which cut the cost of mishandled bags per passenger to 67 cents.

To put this in some perspective, in 2013 the aviation industry's operation cost was \$219 per passenger and the industry average profit margin per customer was \$7.50. While the cost of mishandled bags per passenger represents just 0.31 percent of that operating overhead, reducing expenditures on mishandled bags would have a positive impact on the profit margin.

To further understand the progress made, it helps to look at the 10-year trends the report spells out.



The past 10 years have seen passenger numbers grow by 67 percent, from 1.89 billion in 2003. In the same period the aviation industry has weathered a tough economic cycle as profits were heavily dented by global recession after the boom of 2007.

Despite this considerable challenge, the total number of bags mishandled reduced by 12.5 percent across the 10 years and the total bag mishandling cost to the industry was cut by 6 percent. The economic pressures are clearly reflected in the long-term bag handling trends. In the first five years there was a rapid rise in the number of mishandled bags, with a year-on-year increase of 4 percent in 2004 growing to a year-on-year rise of 32 percent in 2007. The total bag mishandling cost to the industry followed a similar pattern, rising 4 percent in 2004 to a year-on-year rise of 32 percent in 2007. In that year the total number of mishandled bags peaked at 46.9 million and the total mishandling cost to the industry topped out at \$4.22 billion.

The number of mishandled bags per 1,000 passengers also reached a 10-year high of 18.88. However, as recession tightened its grip throughout 2008 and 2009, the aviation industry tackled costs, and worked to improve the passenger experience, by addressing baggage mishandling issues. A number of technical innovations, plus an industry initiative supported these improvements. In 2008, for example, the International Air Transport Association launched its Baggage Improvement Program, an industry-wide action plan, which ran until 2012, to help airports and airlines identify areas where they could reduce bag mishandling. The aim was to achieve a 50 percent reduction in the mishandled bag rate.

## TRANSFER BAGS

The report highlights the adoption of "pull technology", which can be used to build flights more intelligently.

"Early bags are stored and then called forward by the system, along with on-time bags to a make-up area, where all the bags for the flight arrive within a specific time period," the report says. "Instead of bags arriving over a period of one or more hours, all bags arrive at the baggage make-up area within a much shorter time, here baggage staff or robots


quickly build the containers for a flight."

However, at the other end of the spectrum lies the challenge of the transfer bags.

"The transformation in transfer bag performance over the past eight years has been helped by greater messaging reliability, enabling bags with short connection times to be identified before they arrive at the airport," the report states.

"This allows 'runners' to be dispatched to the aircraft to find and separate out any 'short connect' bags."

The way bags are segregated in the aircraft has also been improved, the report adds, with smart bag systems building the load to ensure "hot bags" with a 45-minute turn around can be off-loaded first, while those bags with more than a



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90-minute turnaround times are unloaded afterwards.

On the technical side, there has been increased tracking of bags throughout the handling systems and at various stages of processing them onto the aircraft via scanning of the bar code on the bag-tag, either on hand-held scanners or via automatic reader arrays in the bag-

gage handling system. This information can be shared, so if the airport has the appropriate technology, it has a greater understanding of what is happening to the bags at any given time and can identify and react to problems.

More recently, some airports and airlines have also started scanning arriving bags terminating or transferring at

the airport, which allows them to both monitor ground handler performance and confirm that bags have arrived.

Baggage handling technology has become more and more sophisticated over the last 10 years. Short connection times mean that bags must be handled quickly and efficiently. The solutions required are influenced by the physical attributes of

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## Airport, Airline And GSE

The world's top 100 airports have made significant improvements in bag handling performance in 2013, with a global decrease in mishandled bags of 13 percent.

The report points out the correlation between the size of the airport and the level of bag mishandling.

Among the very largest, Tier 1 airports, with traffic in excess of 25 million passengers annually, the rate of mishandling is dropping faster than among their Tier 2 counterparts with traffic 10-25 million passengers annually. Overall rates of bag mishandling among Tier 1 airports reduced by 14.5 percent, compared to a reduction of 8 percent among Tier 2 airports.

Airline operators around the world have also faced challenging operational conditions over the past year as well as 10 years.

### EUROPE

Association of European Airlines members continue to enhance the bag handling performance. In 2013 they achieved a 6 percent reduction in the rate of mishandling compared to 2012. Over the past 10 years, the members improved at a greater pace. Since 2003, the rate of mishandling has been reduced by 41 percent.

### UNITED STATES

Baggage performance suffered a minor reversal in 2013, when the rate of mishandling increased by 4 percent from 2012. The 10-year performance, however, remains strong with the rate of bag mishandling improving by 23 percent since 2003.

### ASIA PACIFIC

For Asia Pacific carriers, the year 2013 saw mishandling baggage rates reach 1.96 bags



the airports. Where bags only need to travel short distances, belt-based handling systems can provide cost-effective

solutions; however as bags need to travel further (and faster), then high-speed solutions such as destination-coded vehicle

(DCV) systems are able to quickly move bags around the airport, ensuring that minimum connect times are met. ✈️

**More recently, some airports and airlines have also started scanning arriving bags terminating or transferring at the airport, which allows them to both monitor ground handler performance and confirm that bags have arrived.**

## Perspective

per 1,000 passengers, up 12 percent from 2012.

A 10 percent increase in the number of passengers carried system wide in 2013 and larger baggage volumes may have contributed to the increase. Natural disaster and political unrest also took their toll.

“Nevertheless, the region’s mishandled baggage rates remain significantly below the global average,” the report adds.

### GROUND SERVICE PROVIDER

The report highlights the steps planned by ground service provider dnata, that promises to turn the task of baggage handling to baggage processing at least at Dubai World Center.

Dnata is considering a complete city check-in with automatic transfer of bags to the Al Maktoum Airport and, for those arriving passengers staying in Dubai, bags will be transferred from the airport to their hotels in Dubai.

“In the future, customers won’t want to touch their bags at the airport but will want them to arrive at their destination and not have to worry about it,” says Bernd Struck, the company’s vice president of baggage services. That’s coming and will be an integral part of our planning for the new Dubai World Central airport.”

The company’s basic idea is to give customers the possibility to either check-in for their flight and drop their bags either at the hotel or go to a city check-in terminal.

“That means the passenger just takes the metro or a taxi out to the airport in the evening and proceeds directly into the boarding area for their flights,” Struck adds.

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## How To Conduct Safe Aircraft Refuel Servicing Operations

*With flash and ignition temperatures at levels this low, it becomes a matter of utmost importance to ensure that all aircraft fueling and fuel services are carried out in accordance with the highest standard of safety.*

By Aaron Johnson

**F**lashpoint is defined as “the temperature at which a particular organic compound gives off sufficient vapor to ignite in air.”

For example, gasoline will ignite and burn at  $-45^{\circ}\text{F}$ . The flashpoint of standard aviation gas (AVGAS) is  $46^{\circ}\text{C}$  ( $-50^{\circ}\text{F}$ ), Jet B can be as low as  $-23^{\circ}\text{C}$  ( $-10^{\circ}\text{F}$ ), and Jet A has been calculated at a minimum of  $38^{\circ}\text{C}$  ( $100^{\circ}\text{F}$ ), about the same as diesel fuel.

With flash and ignition temperatures at levels this low, it becomes a matter of utmost importance to ensure that all aircraft fueling and fuel services are carried out in accordance with the highest standard of safety.

The National Fire Protection Association is an organization dedicated to reducing the burden of fire and other hazards to life safety by providing consensus codes and standards, research, and education. It is this organization that has set the standard for fire pro-



Aaron Johnson

Besides being trained on the proper use of fueling equipment, operators must also be trained on the operation of emergency controls and the actions to be taken in the event of an emergency. All training records should be maintained and made available to the local fire official (commonly referred to as the AHJ, authority having jurisdiction) when requested.



# Operational Compliance Self-Evaluation Checklist

## Have all personnel been properly trained in all areas? (NFPA 407:5.1.1)

- knowledge of fuel types used
- operation of equipment
- emergency controls
- emergency/spill procedures
- fire extinguisher operation/use

## Are all fuel vehicle properly marked? (NFPA 407:5.1.3)

- name of operator/organization
- fuel type
- hazards

## Are proper spill procedures in place? (NFPA 407:5.2)

- activate shutoff, notify supervisor, initiate clean-up
- contact fire department (over 10 feet, or 50 feet square)

## Are emergency fuel shutoff systems maintained? (NFPA 407:5.3)

- device is accessible
- system tested within last 6 months -  
Date tested \_\_\_\_\_
- every device tested within last 12 months -  
Date tested \_\_\_\_\_
- documentation is up-to-date and readily accessible

## Are all bonding cables in place, functional, and used properly? (NFPA 407:5.4)

- Yes  No

## Are all vehicles clear of aircraft being fueled? (NFPA 407:5.6)

- no vehicles permitted within 50 feet of fueling aircraft
- fuel service vehicle at least 10 feet from aircraft fuel vent system

## Is use of electrical equipment prohibited on service ramp? (NFPA 407:5.7)

- battery charger use discontinued
- no power tools being used
- ground power units not being connected/disconnected
- use of photographic equipment suspended
- communication devices not utilized

## Are vehicles properly positioned for fuel operations? (NFPA 407:5.10, 5.12)

- aircraft is minimum 25 feet from any hangar, terminal, or service areas
- aircraft positioned for easy access by emergency responders
- servicing vehicle maintains clear egress path in case of emergency

## Are proper fire extinguishers in place? (NFPA 407:5.13)

- (2) rated 20-B:C
- (1) mounted on each side of vehicle
- visible/accessible/inspected monthly
- last annual service -  
Date \_\_\_\_\_
- inspections recorded and documentation current and available wheeled 80-B:C extinguisher available (for fuel system capacity over 200 gpm)

## Is all equipment properly maintained? (NFPA 407:5.16, 5.17, 5.18)

- hose inspected daily
- hose inspected monthly -  
Date last tested \_\_\_\_\_
- records maintained and available
- vehicles free of combustibles (grease, oil, etc)
- any leaking vehicles removed from service
- vehicles parked 10 feet apart

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# AIRCRAFT REFUELING

tection and life safety for aircraft fuel servicing operations in their document, NFPA 407, Standard for Aircraft Fuel Servicing.

## BEST WAY

Many times as we go through our workday in our respective careers we wonder why we do things the way we do. And we wonder if we are doing things right, or the "best way." This brief introduction and overview of the operations section of NFPA 407 will enlighten you as to why fueling operations are conducted as they are, and serve as a guideline to ensure that your operation is performing these operations in a safe, and code compliant manner.

NFPA 407, Chapter 5 outlines the required safe operational practices during fuel operations.

- **The foremost requirement is that only properly trained per-**

## sonnel are permitted to conduct fueling operations.

Besides being trained on the proper use of fueling equipment, operators must also be trained on the operation of emergency controls and the actions to be taken in the event of an emergency. All training records should be maintained and made available to the local fire official (commonly referred to as the AHJ, authority having jurisdiction) when requested.

- **Fuel vehicles shall be marked.**

This standard requires both sides of the fuel vehicle to be marked with the name of the operator or responsible organization. Other standards also mandate the fuel trucks be properly placarded with type of fuel and associated hazard.

- **If a spill should occur the following procedures should be followed: activate the emergency fuel shutoff, notify supervisor,**

**initiate clean-up by trained personnel only. If the spill is greater than 10 feet or more than 50 feet squared or presents an immediate hazard, the airport fire rescue crews should be notified to respond.**

- **The integrity of the emergency fuel shutoff system shall be maintained at all times.**

There shall always be a clear access path to these devices. This standard requires that the emergency fuel shutoff systems be functionally tested every 6 months, and each device tested annually. These tests and any deficiencies shall be documented and associated records retained.

- **When passing through pumps, piping, and filters of a fuel system aviation gas and Jet A fuels create an electrostatic charge. To prevent spark and possible ignition, the fuel equipment shall be bonded to the aircraft.**

The bonding cable shall be attached prior to, and throughout, the fueling operation. When fueling is complete, the bonding cable shall be removed in the reverse order from which it was applied (it was placed first, it should be detached last).

- **Special notice should be given to the position of other vehicles around the aircraft prior to beginning the fueling process.**

Internal combustion engine vehicles should not be permitted within 50 feet of the aircraft being fueled. The vehicle performing fueling operations is not to be positioned within 10 feet of the aircraft fuel vent system.

- **The use of electrical equipment on the servicing ramp during fueling shall be prohibited.**

This includes battery chargers, connecting/disconnecting of ground power generators, power tools, photographic equipment, and communications devices. Additionally, any connected ground power units should be positioned as far as possible from fueling points and tank vents.

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- **It should be obvious, but the lack of stating the obvious is what most often leads to mishaps and fire incidents, no open flame devices are permitted onto the fuel servicing ramp.**

This should be accomplished by the posting of “No Smoking” signage, and the prohibiting of personnel from carrying lighters and matches on their person.

- **The aircraft to be fueled is to be positioned so that it is no closer than 25 feet to a hangar, service building, terminal or loading area.**

The fuel vehicle operator should pay attention to the positioning of his vehicle, in relation to the location of the aircraft, to ensure that accessibility for emergency crew access is maintained. Also, the fuel vehicle operator should ensure that he has a clear path of egress for himself if an emergency should occur.

- **A minimum of two fire extinguishers are required on each fueling vehicle.**

They each must be rated at 20-B:C (this rating will be stated on the extinguishers label), and one should be mounted on each side of the vehicle. If the capacity of the fuel system is greater than 200 gpm then an additional 80-B:C wheeled extinguisher is required at the fueling site.

All fire extinguishers must be visible and readily accessible. Fire extinguishers are required to be inspected monthly (this can be done by assigned facility personnel). This inspection is looking for a few basic things: is the extinguisher in its proper location, is the pressure gauge in the green (if not, it needs to be serviced), is the extinguisher in good condition and free of visible defects.

Furthermore, every extinguisher is required to be inspected and tagged annually by a licensed fire extinguisher technician. These inspections must be documented and available for the AHJ upon request. The use of fire extinguishers is a required component of



Aaron Johnson

*All fire extinguishers must be visible and readily accessible. Fire extinguishers are required to be inspected monthly. This inspection is looking for a few basic things: is the extinguisher in its proper location, is the pressure gauge in the green (if not, it needs to be serviced), is the extinguisher in good condition and free of visible defects.*

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# AIRCRAFT REFUELING

the fuel servicing personnel training program.

For further information refer to NFPA 10, Standard for Portable Fire Extinguishers which details all the requirements for fire extinguishers (type, size, location, maintenance, servicing, and use).

▪ **All fuel servicing equipment must be maintained in good working condition.**

The only way to tell that equipment is still in its proper usable condition is to provide regular inspection, testing and maintenance of the various system components.

The most important component of the fuel system is the hose itself. This should be inspected daily. Inspection of the hose should be conducted by extending it out to normal use length, and looking for any evidence of blistering, cuts or nicks. The couplings should be examined for slippage, misalignment or leaks.

At least monthly, the hose is to be extended for its full length and inspected for damage as previously stated. In addition, the nozzle screens should be examined for pieces of rubber which is an indication of interior deterioration. The hose should then be tested at working

pressure, any twisting or ballooning indicates weakness.

If any of these issues are noticed the hose should be taken out of service.

Fuel servicing carts and vehicles should be neat and clean. Grease, oil and other combustibles shall not be present on the vehicle. If any leaks are spotted, the vehicle should be taken out of service, until repairs can be made.


A minimum of 10 feet between parked vehicles shall be maintained to allow for fire protection and control purposes.

The effects of a fire incident, no matter the size, can be far reaching. Fire effects organizations in five ways: Economically, a fire can result in loss of

**By following the guidelines laid out in NFPA 407, loss from fire can be prevented, and life safety of employees and customers maintained.**

jobs or loss of contracts. Organizationally, a fire contributes added cost to the business operations. Legally, civil litigation and lost time can ensue. Psychologically, employees and customers are subjected to a traumatic experience. Politically, the company can lose community support.

By following these guidelines laid out in NFPA 407, Standard for Aircraft Fuel Servicing, loss from fire can be prevented, and life safety of employees and customers maintained.

This brief overview should give you a good place to start to ensure that your facility is on the path to full compliance and a safe operation. Utilize the operations safety self-evaluation to determine your areas of strength, weakness, and greatest need. All referenced codes and standards are available for free, as read-only, from <http://www.nfpa.org/codes-and-standards/document-information-pages> 

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## About the author:



Aaron Johnson has been in the fire protection and life safety industry for nearly 10 years. He began his career as a firefighter, then transitioned to fire prevention. He currently serves as fire marshal for a Fortune 100 aircraft manufacturing corporation. He also blogs about fire protection and life safety issues at [www.TheCodeCoach.com](http://www.TheCodeCoach.com).



# FOD

## Three Letters That Can Spell Big Problems

*Boston Logan International Airport addresses potential FOD problems head on as it becomes the first U.S. airport to adopt an automated FOD detection system*

By Ronnie L. Garrett

**A**t airports, there are three letters that spell big problems: FOD.

Short for foreign object debris left behind on airport runways, taxiways and aprons, the fragments pose a significant problem that leads to damages in the billions of dollars for airports and airlines every year.

Left untouched or unnoticed, these three letters can represent another word too—Disaster.

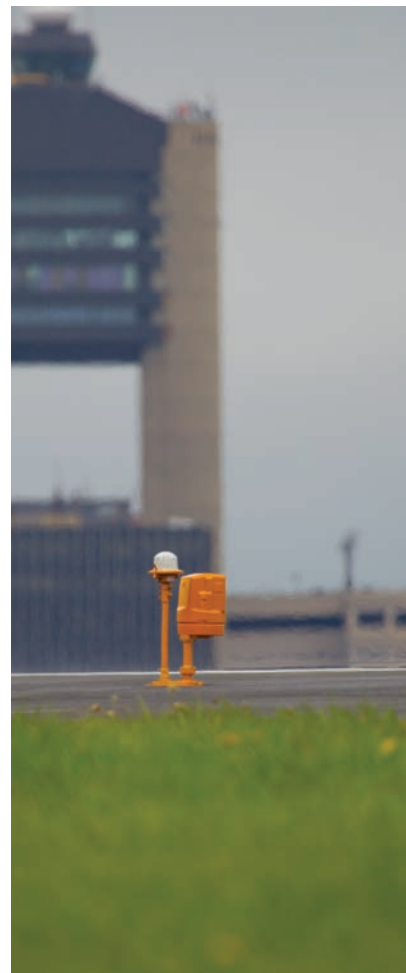
On July 25, 2000, a metal strip detached from a Continental Airlines plane and fell on the runway at Paris Charles de Gaulle Airport. This debris punctured the tire of a departing Air France Concorde jet spewing bits of rubber into the air, some of which punctured the aircraft's fuel tanks causing the plane to crash shortly after take-off, killing 113 people.

In the years since, Charles de Gaulle installed an automated FOD detection system from Xsight Systems, headquartered in Boston, MA, to supplement the manual checks already being performed. Airports in Tel Aviv and Bangkok have

also followed suit, according to Arik Fux, head of Xsight's U.S. office.

And in November, Boston Logan International Airport unveiled a \$1.7 million FODetect system on 09-27, the airport's busiest, 7,000-foot-long runway. This installation is the first of its kind in the United States. "We are honored to be selected for this installation, 13 years after the Concord crash," says Fux. "Massport (the Massachusetts Port Authority) is very proactive in adding cutting-edge technology that helps keep the airport as safe as possible."

The FAA funded \$900,000 of the project through the Airport Technology Research Program, under an agreement that enabled Massport to provide the remaining funding and procure the Xsight technology. The agreement also calls for a one-year-study to evaluate the safety benefits of the automated detection system versus traditional FOD best practices, reports the FAA.



“Using technology to find and remove potentially damaging objects on the airfield takes safety up another notch at Boston Logan,” said Christa Fornarotta, FAA associate administrator for airports, when the project was unveiled. “Massport has a long history of investing in cutting-edge technology and working with the FAA on important airport safety initiatives.”

## THE CASE FOR AUTOMATION

Currently, the FAA requires airports to manually check their runways, taxiways and aprons at least once every 24 hours. But this is a regulation set decades ago when air traffic volumes were far smaller than they are today, according to Fux.

Airports traditionally use vehicles to

## “Using technology to find and remove potentially damaging objects on the airfield takes safety up another notch at Boston Logan.”

*Christa Fornarotta, associate administrator for airports, FAA*

scan pavement and rely on sweepers, vacuums and magnetic bars to clear the debris. Massport currently performs such checks three times a day, and will continue to do so even with the automated technology in place.

A manual inspection system works remarkably well, but it is subject to human error. “An automated runway inspection by machine can do a better job than a human,” Fux says. “There may be hundreds of takeoffs and landings in between every manual inspection. An automated system scans continuously.”

Boston Logan’s automated FODetect system features 68 sensors, mounted on runway light fixtures every 200 feet, which continuously scan 180 degrees along the length of the runway, looking for debris that might include things like dislodged airplane parts, chunks of asphalt, metal shards, bolts, rocks and more. The system utilizes an integrated optic sensor with NIR illumination and millimeter-wave radar sensing technology to detect the smallest FOD and birds. The technology is supported by the company’s proprietary image processing software, and the system’s Surface Detection Units include a powerful local processing unit connected to the system server and operator interface, making it possible to scan runway surfaces in under a minute.

When the system spots an object—even one as small as

a rivet, it activates an audio-visual alarm in the airport’s control tower and sends live video feeds and GPS coordinates for the object to appropriate airport personnel, who evaluate whether the debris must be removed. An operator views the live video of the detected object and receives physical data (size and location) to help him determine whether to take action in compliance with FAA AC 150/5210-24 Chapter 6.

“The system’s FOD visualization and interrogation capabilities assist the operator in identifying the FOD, its location and its size to minimize false alarms,” Fux says. “And if the FOD is determined a danger, operators can then use its GPS location, blinking closest edge light, and its number and laser line marker to pinpoint the FOD and quickly retrieve it.”

FODetect is remarkably accurate, according to Fux. “The distance from the sensor to the area being scanned is up to 100 feet,” he says. “It’s a very close distance, allowing the operator to zoom in to obtain a clear image of what’s going on.” He explains that if the sensors were located further away, both inclement weather conditions and objects would stand between the sensor and the pavement being scanned.

“Because we’re co-located with the runway edge lights, there is nothing between the sensors and the runway,” he says. “We have a very clear view that gives us the best conditions possible to monitor the runway.”

In evaluations with the FAA, Fux says the system was able to locate even the smallest of screws. But airports can set thresholds at levels that work for them. “It’s based on a risk analysis perspective, based on what they want to react to, balanced by the need to close the runway when they react to something,” Fux says. “The system is configurable in a way that

## Mini Buyer’s Guide

To date, four manufacturers have developed automated FOD products:

- [www.xsightsys.com](http://www.xsightsys.com)

Boston, MA-based XSight’s product is FO-Detect, and the system uses small detection units that contain both radar and camera units mounted near the runway edge. The units scan the area and send an alarm message to the operator when FOD has been located. It also sends a video image to easily retrieve the debris.

- [www.trexenterprises.com](http://www.trexenterprises.com)

San Diego, CA-based Trex Enterprise’s FODFinder is a mobile detection system that can be mounted to the roof of a vehicle. The system provides a radar and video image of the debris and once retrieved takes a photograph of the item and assigns a barcode for inventory purposes.

- [www.tarsier.qinetiq.com](http://www.tarsier.qinetiq.com)

UK-based QinetiQ’s Tarsier Radar uses tower-mounted radar units that continuously scan pavement services and alarm and send a message identifying the location of the FOD.

- [www.stratechsystems.com](http://www.stratechsystems.com)

Singapore-based Stratech’s iFerret system uses a high-resolution camera to scan the runway. The software adapts to changing lighting and surface conditions and sends an alarm signal when debris is found.

— Courtesy of FAA Fact Sheet—Foreign Object Debris (FOD)



allows them to set the threshold at the levels they require.”

FODetect is also a great tool to detect dead birds or wildlife on the runway, which is monitored by the U.S. Department of Agriculture. The system provides pinpointed information, in terms of where a bird strike occurred and which aircraft was involved. “It’s very easy for them to tie a bird strike to a specific aircraft,” Fux says.

The system also archives event data and images for future analysis. This allows airport officials to perform timely debris detection, which means they can identify the aircraft involved and the piece located on the runway. For example, if an aircraft loses a fuel cap as it lands, airport officials can identify which aircraft and notify personnel about the missing fuel cap by the time they pull into the gate.

## INSTALLATION DECISIONS

Deciding where to put the system might be the most difficult part of the installation process.

Boston Logan selected 09-27 because it was its most heavily used runway. Massport is contemplating adding the system to other runways in the future.

“It makes sense for airports to have FOD detection systems for older surfaces,” says Fux. “And it makes sense for airports to start with the oldest runways first, followed by the ones that are under the heaviest use.”

**“There may be hundreds of takeoffs and landings in between every manual inspection. An automated system scans continuously.”**

*Arik Fux, head, Xsight U.S. office*

Once it’s agreed that a system like this is needed, funding becomes the next hurdle to clear. According to Fux, the FODetect system is Airport Improvement Program (AIP) eligible. In fact, Miami International Airport just obtained AIP funding for \$2.5 million of a \$5 million FOD system. The remaining portion will be paid for by the airport, says Fux.



Once a project like this is approved, it takes just a few months to get it operational, according to Fux.

The first step is working on the design of the infrastructure in the installation. Because the Xsight system uses existing infrastructure—runway lights—the installation involves using cables in the existing conduit system.

“No trenching or major civil engineering work is needed on the airfield,” says Fux. “After the design phase is concluded, which typically takes just a few weeks, installing the infrastructure takes

about two months, and has no impact on airport operations. The work is done during the night or at other times when the runway is not in use.”

The final phase is to install the actual units then test and commission the system with airport operations and the project management team. It also involves training personnel to use the system,

which Fux says is very intuitive to use. The man-machine interface is based on an airport map, with icons on it that show the location of the units. Operators simply double click on the sensor they wish to view in order to retrieve the available video and make decisions on what they see.

“Our experience has been that within a couple of hours, the employee knows everything they need to know to operate the system,” he says.

With the FODetect system in place, FOD may someday become a three letter abbreviation that stands for “detected” foreign object debris. Automating this process can have a positive effect on both the top and bottom line of an airport, through greater efficiencies and greater safety.

“FODetect is a paradigm change to how runway surfaces are managed,” says Fux. “We are optimistic that other airports around the country will adopt this important technology.” ✈️

## About the author:



Ronnie L. Garrett is the editor of Airport Business magazine. This article originally appeared in the February/March 2014 edition of Airport Business.



More than 1,500 people attended AviationPros LIVE to check out products displayed by 118 exhibitors.

## Five Products We Saw At AviationPros LIVE

*Two-day event also included the announcement of the winners of our annual Ground Support Leaders awards.*

By Steve Smith

**M**ore than 1,500 people attended AviationPros LIVE 2014 at the Sands Convention and Expo Center, Las Vegas, NV, to check out products displayed by 118 exhibitors. Here are just some highlights we liked during our booth visits.

### Harlan Global

Harlan had an eye-catching green lithium-ion/diesel hybrid, Freedom Hybrid Model HLH that was currently undergoing testing with an airline at Singapore Airport. Around one-hour of diesel could borrow the batteries for a full-shift. The unit could be also used for pushback of small aircraft with an optional package

The company was also touting a novel way of recharging electric GSE.



Freedom Hybrid Model HLH from Harlan Global

The OLEV Wireless Power Transfer Systems for electric vehicles allows the electric equipment to charge when stationary without any operator training or interaction with the system. The OLEV system charging pads can be installed under pavement for a complete-

ly transparent power solution.

We've read more about this lately, particularly on posts to our magazine's LinkedIn Group. Basically, the in-ground charging pads can be installed flush with grade. Underground cables connect with a power inverter. OLEV was named one of the 50 Best Inventions of the Year 2010 by the *Time* and the "Top 10 Emerging Technologies for 2013" by the World Economic Forum.

### Iscar GSE

Iscar displayed a couple of products new to the its lineup. The first was a Lav



Lav Service Cart LSC-250 from Iscar GSE

Service Cart LSC-250. The heavy-duty construction featured a lower profile operators platform, and flow meters and dump flows positioned more ergonomically. Also on display was the E28, a 28.5 V DC power unit generator. The raid-start and pick-up are built-in specifically for cold operation. But several feature make the unit particular easy to maintain. Removable panels and doors provide easy access to engine and generator components. A removable control panel make troubleshooting and repairs simple. A "service engine" switch allows the low-noise unit to operate without generating any power making service safer.





Steve Smith

Hobart PoWerMaster® 2400 from ITW Global GSE

## ITW Global GSE

ITW Global GSE, displayed the Hobart PoWerMaster® 2400, the division's next generation of 400 Hz solid state frequency converters ideal for all types of aircraft.

The Hobart PoWerMaster® 2400 will be the only solid state converter on the market with an overload capacity of 400 percent. This new generation of converters is designed to ensure overload requirements are not a concern for the new aircraft coming on the market today. In addition to the substantial overload, the Hobart PoWerMaster® 2400 offers a true power factor of 1 that provides 90 kW continuous at an ambient temperature of +132 degrees F. This means the solid state frequency converter can be used on aircraft of virtually any size, including the latest generation of aircraft such as the Airbus A380, A350, the Boeing 787 Dreamliner and the upcoming B777.

The Hobart PoWerMaster® 2400 is constructed in a modular style, affording users an easy and quick overview of all components for ease of operation and faultfinding. The Hobart PoWerMaster® 2400 has numerous features allowing easy connection to communication systems.

This latest solid state frequency

converter includes patented technology, Plug & Play that provides a perfect regulation and a steady voltage at the aircraft plug. An added feature is the newly designed display featuring icons for easy and intuitive use.

## Page Industries

Page Industries' new PCA610 PCAir connector is a 8-inch nylon composite

that comes standard with a field-replaceable SNAP-IN gasket (no caustic glue, scrapping or cure time), internal spinning ring to eliminate twists in the hose, built-in FOD screen and incorporates the largest internal diameter of any connector to provide maximum air flow to the aircraft. Also a first to the GSE industry, PAGE's revolutionary design has easy to use "TWIST ON/

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## 2014 Ground Support Leader Awards

We presented the following ground support industry leaders with our annual Ground Support Leader Awards during last week's AviationPros LIVE in Las Vegas:

- Product Leader:** Rampmaster for its Engine Management System. This award "celebrates the product, service and manufacturer making a difference in the industry." (You can read more about the EMS on page 6.)
- Team Leader:** Tom McCartin, senior director for refueling operations at Southwest Airlines. His award honors "an individual who has taken a leadership role with personnel." Tom's nomination read in part: "His team is a reflection of himself, he makes honest and ethical behavior a key value and his employees follow his suit. His delegation is identifying the strengths of his team, and capitalizing on them. He is very clear and succinctly describing what he wants done this extremely important, He can relate his vision to his team."
- Lifetime Achievement Awards:** Alan J. Janis, late founder of J&B Aviation Services. This award



*Jeff Greeson from Southwest Airlines accepted Tom McCartin's Team Leader Award from Missy Zingsheim, associate publisher.*



*Bruce K. Warne talked about starting J&B Aviation Services with his late partner Alan J. Janis, winner of our Lifetime Achievement Award.*

goes "to the person who has demonstrated commitment to the industry through numerous years of dedicated service." In 1991, J&B Aviation Services, Inc. opened its 2,400 square-foot office and warehouse facility in Fairfield, CA. The company, founded by Janis and Bruce K. Warne, filled the void in the marketplace for products and services that the absence of McCormick Morgan Power Systems Engineers had created. J&B's expertise and insistence upon premium quality products promptly gave them the reputation as the industry leader. Their unique 400 Hz cable assembly designs, with options for replaceable noses, swiftly became the most popularly used assemblies both with commercial and government customers.

In addition, to this month's cover story on Rampmaster award-winning product, we will follow with cover stories highlighting McCartin and remembering Janis in our May and June/July issues, respectively.

OFF" technology utilizing a slot-filled design with a robust internal modular latching mechanism that ensures a positive connection to the aircraft. No other PCAir connector offers all of these 3 elements.

The company also announced its exclusive agreement with IGS/Wauben Aviation. PAGE now promotes for commercial and military applications IGS's complete array of fuel, power and air in-ground pits along with 400 Hz cable crocodiles. The new deal follows an announcement a month before the show that FCX Systems, had entered into an exclusive agreement with PAGE Industries. This agreement allows PAGE to market and sell the FCX 400 Hz, 270V DC and 28V DC full product line to both the commercial and military markets. FCX and PAGE, encompassing more

than 60 years of combined experience in the GSE industry.

### WASP Inc.

Wasp Inc. introduced a versatile New Standard Dolly to replace multiple dollies with various capacities.

"With the New Standard Dolly, customers get the high quality WASP is known for at a value price," WASP President and CEO Dane Anderson said. "Its versatility adds even more value by maximizing equipment utilization and worker efficiency."

WASP optimized the industrial design of the New Standard Dolly for its manufacturing process so it can build the equipment with more stock steel sizes and components and reduce labor costs. Because of that, the company can manufacture and hold units in in-



*PCA610 PCAir connector from Page Industries*

Page Industries





Ronnie Garrett

### New Standard Dolly from Wasp

ventory for quick fulfillment.

The New Standard Dolly has a 15,000-pound (6,804-kilogram) capacity and the versatility to carry LD-2, LD-3, LD-4 and LD-11 containers, as well as two LD-2 or LD-3 containers at a time. It also takes half pallets, 88-by-125-inch (224-by-318-centimeter) pallets and 96-by-125-inch (244-by-318-centimeter) pallets. LD stops and vertical restraints throughout the unit firmly lock containers in place.

The unit's heavy-duty steel frame, Grade 5 zinc hardware and 69 high-load-capacity casters minimize in-the-field failures. Drain holes in the steel decking on either side of every caster allow water to travel through rather than collecting and tarnishing or freezing and obstructing the casters. The formed decking is boxed to make the unit as strong as possible.

Tineways between the casters allow forklift operators to place containers and pallets on the dolly and remove them. If needed, the tineways double as a non-slip walkway so operators can safely walk on the dolly to push containers.


WASP's integrated towbar is spring loaded to prevent it from hitting the ground when dropped. Dual springs provide stronger holdup to prevent injury and extend the life of the towbar. To prevent damage to the tie rod, WASP lines it with a protection tube that is less expensive to replace than the part itself.

The rollers have Zinc Flo-Coat® tubing to prevent rusting and rugged, high-capacity, sealed ball bearings. Roller guards protect the rollers on the perime-

ter of the dolly. The unit also is equipped with towbar-actuated rear brakes.

The dolly features radial-cut corners that reduce the potential for damage when the dolly strikes other dollies, trailers or equipment. WASP stamps indents into the channel for recessed placement of reflectors to prevent damage upon contact with another object. U.S. military-grade powder-coated finishes keep the New Standard Dolly looking new. Custom colors are available. Optional hot-dip galvanizing can further protect the dolly.

The New Standard Dolly can be stacked five high to save space on trucks or in overseas containers during shipping and reduce shipping costs. The bottom dolly retains its functionality, so the stacked dollies have roll-on/roll-off capabilities for transport without crating. An extension pipe fits through the shipping brackets on each corner of the dolly to take weight off of the deck and tires during transport. ✈️



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## FOD Detection

**Xsight Systems Inc.**

FODetect is an automated and comprehensive foreign object debris detection solution collocated with runway edge lights. The most powerful solution to improve runway safety, operational efficiency and increase runway capacity.

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## Backup Camera System

**Rosco Inc.**

Give your drivers the best possible perspective with a heavy duty backup camera system from Rosco. Increasing your driver's visibility can lead to a reduction in accidents and increased efficiency for your aviation vehicles.

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## Wireless Headset System

**Flightcom Corporation**

Flightcom's wireless headset system enhances safety, efficiency and crew communication. It is designed for pushback, towing, deicing, maintenance, cargo and other applications.

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## FOD BOSS

**Myslik Inc.**

The FOD BOSS works by capturing debris as it passes over the tarmac. The force of friction and a series of specially designed brushes scoop up foreign objects and hold them in an easy to empty mesh capture zone. With a sweep width of 2.4 meters (8 feet), 4.8 meters (16 feet), or 7.2 meters (24 feet), the FOD BOSS can clean up to 300,000 square meters (3 million square feet) per hour, at speeds from 6 kph (4 mph) to 40 kph (25 mph). Aerosweep Pty. Ltd. has released the latest improvement to the FOD BOSS speed sweeping system: the Phase Three Retention Blade (P3R). The latest technology provides even greater FOD collecting and retaining capability with new built in ribs.

[AviationPros.com/company/10300255](http://AviationPros.com/company/10300255)





## Integrated Ground Support Headset

### Lynx Avionics Ltd.

An integrated headset and communication adapter providing simultaneous connections to an aircraft intercom, hand-held radio and cellphone. Uses standard interchangeable radio leads and telephone leads or a Bluetooth telephone connection.

[AviationPros.com/company/10246017](http://AviationPros.com/company/10246017)



## WingWalker Railhead Corporation

The WingWalker is a wireless collision avoidance safety system that prevents accidents during pushback operations by providing advanced warning to tug operators. It will improve your safety performance benchmarks while avoiding costly downtime and repairs from avoidable collisions.

[AviationPros.com/company/10615130](http://AviationPros.com/company/10615130)

## Steel Toe Oxford Redback Boots

Redback introduces "The Walk-About" Steel Toe Oxford. Made from 100 percent full grain leather, this shoe is great for the office *and* the field. It has TPU/PU soles for maximum grip on all types of terrain. The anatomic support system cradles the foot to reduce arch sagging and prevents foot strain and related leg and back pain.

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## Low Light Visibility PolyBrite International

Products are ideal for low light and nighttime visibility for professional and recreational use. PolyBrite Lighted Safety products include lighted batons, lighted magnetic base batons and tag lights. Together these PolyBrite products offer enhanced visibility for airport crews and military.

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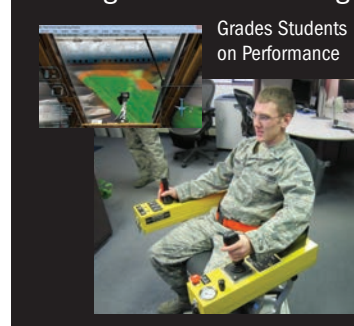
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# PRODUCT HANGAR



## Wireless Communication System

### David Clark Company Inc.

David Clark Company's quality-built headset communication equipment provides clear communications and hearing protection during pushback, deicing and maintenance operations. Our 9900 Wireless Communication System provides maximum mobility and improved safety during ground support operations.

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## Safety Wands

### Safety Wand Corporation

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## Aircraft Guidance System

### J&B Aviation Services - Hobart Ground Systems

JB 1900 Docking System uses both human and mechanical components to guide aircraft for docking positioning. The automatic aspects are comprised of aircraft alignment and a fail safe feature to stop the aircraft in case of emergency. The human aspects of the device allow the handling agent to control the parking of the aircraft while observing critical ramp operations.

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## Safety Products

### U.S. Airmotive GSE

We offer a wide variety of safety products for all types of mobile equipment: Front and Rear LED lights. Strobe lights. Backup alarm-Horns. Safety corner bumpers. Chocks, along with other safety items, such as TowBar Covers, Safety Vests, Day and Night wands Relays, Gauges and Ignition switches. Contact USAirmotive GSE for all your safety needs. 305-885-4992 or 310-327-8407 [www.usairmotivegse.com](http://www.usairmotivegse.com)



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## Safety Markings American Permalight Inc.

Following activation by daylight or artificial lighting, PERMALIGHT photoluminescent safety markings glow in pitch darkness. Available as signage, stickers, tape, paint, plastic chain, bumper guards and more, the nonelectrical, nonradioactive markings emit a high-performance glow in the dark effect when all lights are out and remain visible throughout an entire night, providing important illuminated information in darkness situations.



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## CT-DECT GateCom CeoTronics AG

A digital com system for ground handling. Wireless duplex communication within the ground crew as well as to the pilot on demand; simultaneous transmit and receive for up to eight persons (marshalling agent, wing men, tug driver, pilot); optional connection to trunking radio communication.



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## Water Disinfection Equipment

### AeroSafe Products Inc.

AeroSafe manufactures potable water disinfection equipment to clean and disinfect aircraft water systems. The equipment is available in towable, roll-around, self-contained and wall-mounted systems.

[AviationPros.com/company/11191724](http://AviationPros.com/company/11191724)



## Camera Systems For GSE



### Orlaco Products B.V.

Orlaco vision system could help airport vehicle operators narrow the damage and incident gap. These vision systems give airport vehicle operators a sharp, real time view of whatever the camera sees through a high quality dashboard mounted monitor. Front-mounted Orlaco cameras with application-specific angles allow a push-back truck operator to see clearly behind a smaller

plane; then it can be backed up into position with potential ease.

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## Mobile Workforce Solution

### SITA

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# PRODUCT HANGAR



## Deicing Training Simulator

### Global Ground Support

Global Ground Supports' full-featured deicing simulator allows the user to deice and anti-ice different aircraft under a wide range of weather conditions. Two joysticks control all boom, cab and nozzle movements with the exact speed and commands as the actual Global enclosed cab controls.

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## Safety Clothing

### Transportation Safety Apparel

Transportation Safety Apparel provides workers with a variety of reflective safety products, safety apparel, and protective accessories, including ANSI-compliant, and high-visibility, fluorescent clothing.

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## Noise Reduction Earmuffs

### Pro Tech Technologies Inc.

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## FOD Cleanup Kit DCM Tech, Inc

DCM's HEPA FOD Cleanup Kit for FOD elimination and general housekeeping where heavy metal dust like hexavalent chromium, strontium, lead, or cadmium are present. Kit contains everything for general cleanup on bench tops, parts, floors, and includes specialized FOD tools for removing debris from tight areas inside aircraft, vehicles and work areas.

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## Access Control CyberLock Inc.

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Each key is programmed with specific access schedules based on time, date, and authority level—so only authorized users can access restricted areas.

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## Pushback Headset Comprehensive Technical Solutions

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# PRODUCT HANGAR



## Mobile Spill Station Andax Industries LLC

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## Apron Management Safegate Airport Systems Inc.

The SafeControl family of airport solutions was developed by Safegate Group to improve safety and efficiency by bringing automation and integrated systems to the airfield. SafeControl monitoring and control solutions for airfield lighting and surface guidance systems are trusted by airports and air traffic management worldwide.

SafeControl – Apron Management (SAM) is the newest SafeControl software module offering unmatched integration and data sharing capabilities to maximize safety and efficiency through customized control and monitoring of the apron. SAM can track activity and monitor status whether or not gates are equipped with Safegate's Safedock Advanced Visual Docking Guidance System (A-VDGS). SAM uses the A-VDGS, or connection hubs for gates without A-VDGS, as intelligent sensors to collect and distribute real-time gate and flight data. Vital information is shared between airport, airline and air traffic control systems, making SAM a key step toward an Airport Collaborative Decision Making (A-CDM) program to improve communication and efficiency.

[AviationPros.com/company/10441365](http://AviationPros.com/company/10441365)



## Fall Restraint System ThyssenKrupp Airport Systems

The engineers at ThyssenKrupp have reviewed existing fall protection designs and developed a new patent pending system that many believe will provide a new standard in PBB safety.

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2006 TLD Ace 302-H-CUP 24-Ton Cooling, with Heat Option.  
(2) 2007 TLD Ace 802-H-CUP 115-Ton Cooling with Heat Option

### AIR START UNIT

2007 Tronair, SA280G2 Stored Air Start. 260lb mass usable air  
1992 S&S Model TMAC-250 PPM, powered by Detroit diesel.

### BAGGAGE/CARGO TOW TRACTORS

2010 TUG, MA-40-27LP Ford LPG w/cab.

2001 TUG, MA-30-1 Ford 300 gas, w/cab (2 avail)  
2003 TUG, MT-8-1 Ford gas 8K DBP, w/cab (2 avail)  
2008 Harlan HTAB-40, Cummins diesel, w/cab (2 avail)  
2003 Harlan HTAG-80 Ford gas 8K DBP, w/cab (2 avail)  
1997 Toyota, Model 2-02TD25 diesel engine.

### BELTLOADERS

2007 NMC-Wollard, Model TC-888 4-cyl. Deutz diesel engine.  
2002 TUG, Model 440E, 48 volt electric with built-in charger.

### CONTAINER LOADER

1988 LANTIS, Model 818-218-161-125, High & Wide 161" elevator.  
2006 FMC/JBT Commander 15i with wide option.

### GROUND POWER UNITS

2005 Hobart, Model 120CU24P5, 120 KVA  
2008 TLD, Model GPU4090-T-CUP, 90 KVA  
2001 Hobart, Model Jet-Ex5D 28.5 VDC

### HEATERS

1997 Air-A-Plane Model 5050D, Deutz diesel engine.  
1994 Air-A-Plane, Model 5050GF, Ford 300 gas engine

### PASSENGER STAIRS

2012 NMC-Wollard, Model CMPS170, 77.5" to 170.5" like new.  
2001 Stinar, Model SPS-3518 GMC diesel 96" to 228"  
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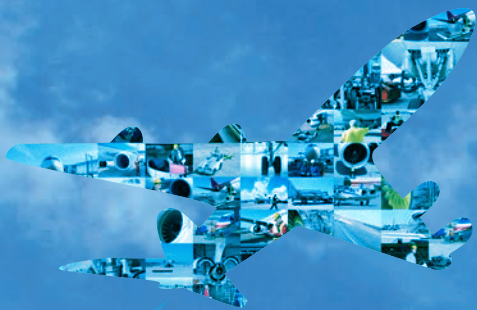
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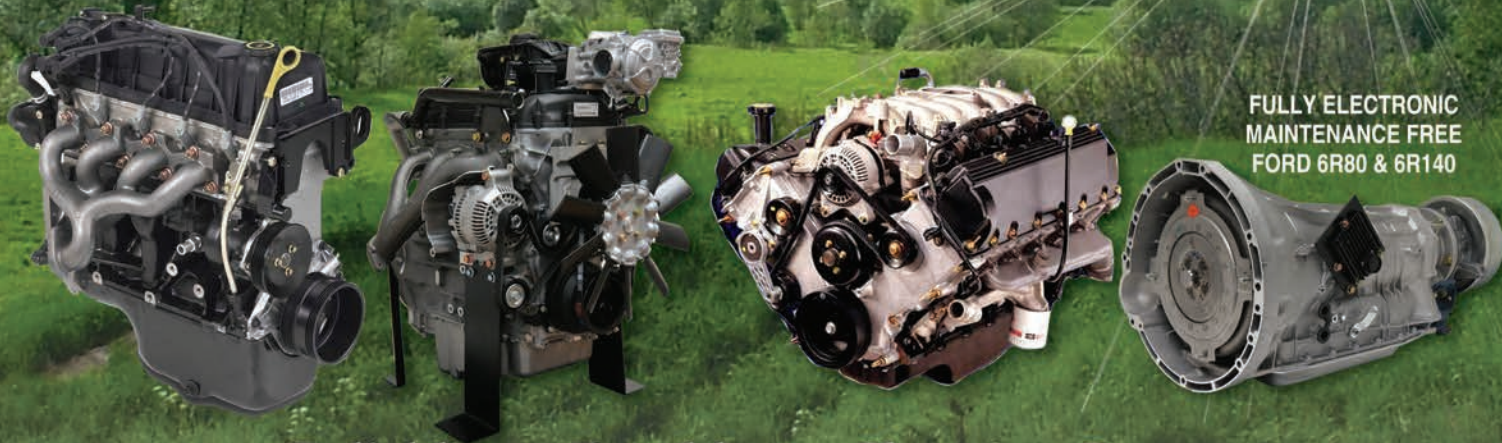
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