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# **GROUND SUPPORT** **WORLDWIDE**

## **NO MORE PUSHBACKS?**

**Manufacturers develop electric motorized systems to allow for engine-off taxiing.**

### **INTERNATIONAL Baggage Handling Developments In Europe**

**The industry looks to be shaping up well to meet the future, and all the luggage 3.6 billion fliers will bring.**

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San Jose  
Convention Center  
San Jose, CA



**Inter airport Europe**  
Munich Trade Fair  
Munich, Germany

## Business Buzz

### Sea-Tac Centralizes PCA:

The Seattle Tacoma International Airport centralized its PCA system to provide cool and warm air to planes at each of its 73 gates. The airport took advantage of a \$22 million

VALE grant, the largest federal grant of its kind, to offset the costs of the \$43 million project that features 15 miles of piping installed within the terminal that connects to a central plant.

### Alaska Airlines Testing Solar-Powered Ramps:

Alaska Airlines is testing solar-powered passenger ramps manufactured by Keith Consolidated Industries, White City, OR, at the Seattle-Tacoma International and Norman Y. Mineta San Jose International airports.

### JBT AeroTech's Revenue Down 2 Percent:

JBT AeroTech's second quarter revenue of \$76 million declined 2 percent from the same period in 2012. Strong equipment sales and after-market volume in ground support, particularly for deicers and cargo loaders during the second quarter was more than offset by lower sales of passenger boarding bridges, military loaders and automated systems.

### Dual Boarding Process Tested:

Alaska Airlines is considering letting passengers enter and exit its Boeing 737s by front and aft doors, the latter down a ramp or stairs to the tarmac. The airline has been experimenting with variations on this "dual boarding" technique at Seattle-Tacoma International Airport, San Jose and Long Beach airports. The airline reports that letting passengers leave out the back can cut unloading time by eight to 10 minutes.

### Demand For Aircraft To Remain Strong:

Boeing Co. expects aircraft demand to remain strong during the next 20 years, and shift to long-range, fuel-efficient single-aisle planes with strongest growth in demand coming from Asia. The company forecasts demand for 35,000 commercial aircraft during the next two decades worth about \$4.8 trillion. That would double the world's fleet of commercial planes.

### Ecotality Exploring Restructuring:

Ecotality Inc. said it is exploring strategic options, including a restructuring or sale, after citing a range of problems, including payment suspensions from the U.S. Department of Energy. The DOE suspended payments to Ecotality after the company warned government funders last week about its poor sales performance and other issues.

### Air Transat Renews IOSA Registration:

Air Transat, which has been registered under the International Air Transport Association's IOSA (IATA Operational Safety Audit) program since 2008, recently became the first airline in the world to renew its IOSA Registration based on the E-IOSA methodology.

### Wheelchair Attendants Drop Complaints:

Workers who push passengers in wheelchairs at Philadelphia International Airport have withdrawn complaints filed with the U.S. Department of Transportation that alleged

## CORRECTION

The listing for J&B Aviation Services was listed incorrectly in our August Worldwide Directory.

*Here is the correct listing:*

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

256 Sutton Place, Suite 104  
Santa Rosa, CA 95407  
United States

**Phone:** 707-469-2600, 800-621-0074

**Fax:** 707-206-9831

**Website:** [www.hobartsystems.com](http://www.hobartsystems.com)

**Email:** [sales@jandbaviation.com](mailto:sales@jandbaviation.com)

they did not receive proper training from their employer, PrimeFlight Aviation Services, or equipment to do their jobs safely. The workers dropped their action naming PrimeFlight and airlines including US Airways Group, United, and Southwest after seeing documentation that they had received the required training.

### Workers Protest Outsourcing:

About 100 United Airlines employees lined a main road leading to Bush Intercontinental Airport in August to protest the possible outsourcing of their jobs. Union leaders fear that outsourcing could drop wages to as low as \$8 an hour and exclude health coverage.

### Disabled Man Sues Delta:

According to the lawsuit filed last July against Delta Air Lines, D. Baraka Kanaan was "forced to crawl across an airport tarmac, up and down the stairs of an airplane, down

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the aisle of the aircraft and out of and into his seat" while boarding a flight last summer from Maui to Nantucket and again when boarding a return flight from Nantucket to Maui, where Kanaan lives.

## American Eagle Fined \$200,000:

The U. S. Department of Transportation fined American Eagle Airlines \$200,000 for lengthy tarmac delays that took place at Dallas-Fort Worth International Airport on Dec. 25, 2012. An

investigation revealed that 10 flights experienced delays that exceeded the three-hour limit at Dallas-Fort Worth during a snow and ice storm.

## \$1 Million Plan To Upgrade LRU Fuel Farm Draws Criticism:

An estimated \$1 million upgrade to bring fuel storage tanks at Las Cruces International Airport into compliance with state environmental regulations is being questioned by some pilots and a longtime airport business. The airport contends that all five tanks and the existing fuel facility do not meet state regulatory rules.

## EnerSys Marks 125 Years:

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## Menzies Buys Into Australian, Colombian Markets:

Menzies Aviation has agreed to acquire the Australian ground handling business, Skystar for £7.7 million in cash (\$12 million), and the Colombian ground and cargo handling business, Desacol for £6.4 million in cash (\$10 million). Skystar operates at eight airports throughout Australia and New Zealand handling 17,000 turnarounds annually for 10 airlines, including Jetstar and Qantas. The deal gives Menzies entry into the Perth ground handling market. Desacol operates in five airports, with its largest operation in Bogota. It handles 60,000 turnarounds and 50,000 tonnes of cargo each year with a number of Menzies' existing customers and provides an opportunity to further develop relationships with key customers such as LAN and COPA airlines.

## Swissport Acquires Servisair:

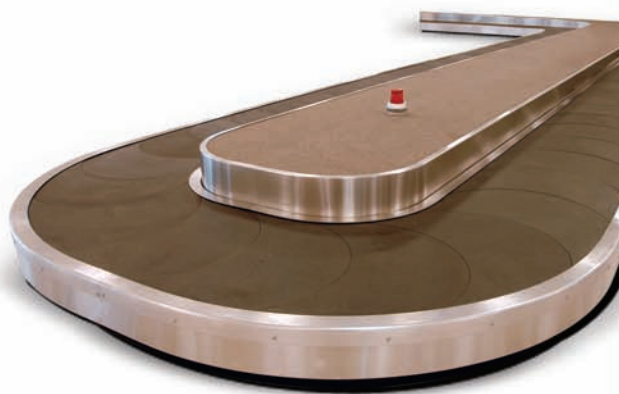
Swissport acquired Servisair from Derichebourg SA (DBG) for 450 million

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euros (\$597 million) in its biggest purchase to date. Servisair provides service at 118 stations in 20 countries with a workforce of 15,000. In other recent deals, Swissport, announced in March it would buy the majority of the ground-handling operations from Nordic airline SAS Group AB. In September 2012, it purchased Flightcare Spain and Flightcare Belgium from Madrid-based FCC Versia SA.

### Cargo Airport Services Acquires IAS:

Cargo Airport Services USA, LLC, acquired Integrated Airline

Services. Founded in 1984, IAS operates in 41 airports in the United States, and is the largest cargo handler at DFW. Some of IAS' customers include EVA Airways, Kalitta Airways, Lufthansa Cargo AG, Singapore Airlines, China Airlines Cargo, Korean Airlines Cargo, Cargolux, DHL, and the UPS States Postal Service. IAS annual revenues are \$65 million and its workforce of 1,600 handles over 300,000 tonnes of cargo a year, excluding integrator cargo airline volumes and USPS mail volumes. CAS has annual revenues of \$130 million and handles 1.1 million tonnes of cargo a year with a workforce of 1,900 people.

## New Deals

### JBT Wins Contract With RDU:

JBT AeroTech has been awarded a five-year airport services five-year contract at the Raleigh-Durham International Airport that is estimated to generate an excess of \$9 million in revenue during its term. JBT AeroTech will provide comprehensive maintenance and repair services for the gate and baggage handling equipment at RDU.

### Michigan Regulators OK Deicing Discharge:

The state's Department of Environmental Quality issued

a first-of-its-kind discharge permit to Gerald R. Ford International Airport, concluding more than a year of review and public process to develop a system for the airport to safely deal with the deicing fluid it uses on planes each winter. Airport officials have committed to construct an on-site treatment system for storm water by Oct. 1, 2015. This will be the first on-site treatment system for deicing fluids at a Michigan airport.

### ASA Signs MOU With IATA:

The Airport Services Association, which represents the needs of the independent ground handling companies around the world, has for-



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# IN THE NEWS

mally signed a MOU with the International Air Transport Association. The agreement marks an important milestone for the independent handling community since it will allow them to play a more significant part in all matters relating to the ground handling sector, according to Samim Aydin, chairman of the ASA. Aydin estimates that 55 percent of all handling operations are now carried out by independent handlers.

## People



**David Bermingham**

has been named CEO of Swissport UK Ground

Handling and Swissport UK Cargo Services. Bermingham will replace interim CEO Robin Dickie, effective September 3, 2013. Bermingham joined the group during June 2012 as CEO, Swissport CargoServices UK. He previously held senior positions within TNT, CEVA Logistics and TDG Logistics.



**Simon Fraser** will be responsible for the overall business operations for

Hobart and J&B Aviation while overseeing the operations of Houchin/ITW GSE UK. Simon has over 20 years of experience managing

airport and airside operations. He is an accomplished leader with expertise in business and operations leadership, engineering, restructuring and business development. For the past six years, Simon has been General Manager of Houchin / ITW GSE UK located in Kent, UK.



**Robert Sorok and Mike Karpe**



joined Palmer Johnson in June and July, respectively. Sorok joins as an outside sales representative based in Denver. Sorok

will cover Colorado, parts of New Mexico, Arizona, North Dakota and South Dakota. Sorok has more than 13 years of experience in the energy industry where he developed large scale energy conservation projects in a wide variety of vertical markets. Karpe comes to Palmer Johnson with a background in sales management. Karpe attended Bethel University where he completed coursework in business and marketing.



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# No More Push



*Manufacturers develop electric motorized systems to allow for engine-off taxiing.*

*By Steve Smith*

**A**ttendees of the Paris Air Show tend to look skyward to take in new aircraft showing off its best moves while in the air.

But at this year's show, eyes were cast decidedly downward as attendees caught a demonstration of an A320 moving backward and making sharp turns on the tarmac at Le Bourget Airport. All with the jet's engines switched off. And without a tug in sight.

The A320 used electric motors developed by Honeywell and Safran SA attached to both sides of the plane's main landing gear and powered only by the APU.

"The system would, therefore, reduce, if not remove altogether, the need for aircraft ground equipment to maneuver aircraft in and out of stands," according to a press release.

The joint venture's product could save up to \$200,000 per aircraft per year in fuel costs, according to the companies.

The aircraft, however, showed off just the latest system designed to save jet fuel, cut carbon emissions and save time while

jets are at their least efficient place – on the ground making the turn at the gate and taxiing to takeoff.

The Honeywell-Safran joint venture has company with at least one other competitor working toward similar ends for a greener ramp. WheelTug, another exhibitor at last June's air show, has gained the most traction among potential customers with its system that fits into the nose landing gear.

At the show, WheelTug announced yet another agreement with Icelandair. With the new reservations on its order books, the company has deals with 11 airlines from Europe, America, the Middle East and the East Asia.

The two systems bare some similarities:

- Both systems are geared toward narrow-body aircraft that typically fly frequent short-haul flights and spend an inordinate amount of time on the ground.


- Both systems are essentially an electric motor run by the APU, which is at the same time a simple idea and an incredibly difficult process to integrate into aircraft.
- Both systems provide full mobility to the plane while it's on the ground without the use of the aircraft's jet engines or tugs for pushback and taxi operations.
- Both systems add weight to the aircraft, which makes the approval process for the equipment that much more difficult. Both companies say that the cost-savings would more than justify the added pounds.

But from those basic similarities, each system splits between the merits of either pulling the plane with motors in the nose landing gear or pushing it with motors in the main landing gear.

## PULLING

WheelTug's electric motors power the nose gear in a package that fits into the existing wheel well space that's 5 inches wide and weighs 300 pounds. By outfitting the nose landing gear, the company





*With airlines concerned about both fuel costs and engine emissions, one recent area of focus has been taxi-out and taxi-in operations. New electric propulsion systems give the aircraft the ability to move on the ground without using engines or ground support equipment.*

Lufthansa Technik

# backs?

says that reduces the weight of such a taxiing system and makes approval of the system less complicated since the noise landing gear does not affect the aircraft's braking system.

"We're turning the airplane into a hybrid," company CEO Isaiah Cox said over the summer on CNBC.

The company says the electric unit needs only 4 pounds of fuel per minute by using the APU, representing an 80 percent reduction in ground operation fuel consumption.

"It's like packing an elephant into the nose wheel," Cox told us.

The company's business plan is to install its electric system into existing aircraft, something Cox says can be done overnight.

To persuade airlines to make the modification, Cox offers his product on very generous leasing terms – as low as "free" with WheelTug sharing in the cost savings.

"Airlines can enjoy cost-savings from Day One," Cox says, "with no capital expenditures."

WheelTug's sales literature offers a

generous range of cost-savings with its system that ranges from \$785,000 to \$2.5 million per plane per year.

Right off the bat, the WheelTug system would eliminate the cost of pushback, which Cox says ranges from \$50 to \$150, and the consumption of about 55 gallons of fuel spent while taxiing before and after takeoff, based on average burn rates and ground times at U.S. airports.

Cox shared other cost-savings that naturally come to mind, such as fuel savings, FOD cost avoidance, taxi-in/taxi-out time savings and pushback savings.

More "aggressive airlines," Cox says, can further take advantage of engine-off operation by boarding/deboarding passenger from the rear door and through the front door.

Also, airports under morning noise curfew restrictions could create more lucrative slots.

"This can add 5-10 additional daily morning take-off slots per runway," Cox says. "First-morning flights are the most valuable for business travelers."

Cox expects certification of its design

## Early Work

L-3 Communications was one of the first companies to test out an engine-off taxiing system.

The GreenTaxi™ technology was successfully demonstrated on Dec. 8, 2011 at Frankfurt Airport. The demonstration took place over four days and included more than 20 hours of taxi and maneuver tests conducted by L-3's Magnet-Motor division and included Lufthansa Airlines and Lufthansa Technik.

The demonstration showed the system installed in the landing gear could operate dependably in varying runway conditions and move the aircraft up to 30 kilometers an hour. In 2012, Crane Aerospace & Electronics announced an agreement with L-3 Space and Propulsion Systems to develop and market the taxiing system. The project later came to a stop.

However, Lufthansa Technik still has what it calls an ongoing "eTaxi" project to continue investigating the application and technical integration of an "electric drive on the main undercarriage for short and medium-haul aircraft for all taxiing movements on the apron."

WheelTug



*Instead of powering the main gear, WheelTug's electric motors power the nose gear.*

sometime in the first half of 2014. Six airlines, including KLM, Alitalia and El Al, have agreements to install the system on

more than 285 aircraft at some point in the second quarter of 2014.

## PUSHING

Safran and Honeywell, on the other hand, have developed an electric unit that attaches to the main landing gear.

Dubbed the "Electric Green Taxiing System," the wheel on each main landing gear is equipped with an electric motor, reduction gearbox and clutch assembly to drive the aircraft, while unique power electronics and system controllers give pilots total control of the aircraft's speed and direction during taxi operations.

Each unit of the Honeywell system, including the motor, gearbox and clutch weighs about 220 pounds or a total of more than 800 pounds.

"EGTS will be for aviation what hybrid cars were for the automotive industry," says Brian Wenig, EGTS program vice president, Honeywell Aerospace. "The potential of fuel savings and emissions reductions that can be had with the system will be monumental for airlines."

According to the joint venture, a short- or medium-range aircraft spends up to 2.5 hours of its time on taxiways every day. As

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## Other Taxiing Possibilities

British engineers say they're looking at ways to design aircraft that are able to generate electricity by harnessing energy from the landing gear.

Researchers from the University of Lincoln say future aircraft could use this electricity to power the plane as it taxis to and from airport gates, reducing the need to use the jet engines.

The energy produced by a plane's braking system during landing, currently wasted as heat produced by friction in the brakes, would be captured and converted into electricity by motor-generators built into the landing gear, engineers said.

The electricity would be stored and then supplied to the in-hub motors in the wheels to provide "engine-less" taxiing, they said. "Taxiing is a highly fuel-inefficient part of any trip by plane with emissions and noise pollution caused by jet engines being a huge issue for airports all over the world," research leader Paul Stewart says.



**Safran and Honeywell have developed an electric propulsion unit that attaches to the main landing gear.**

a result, the EGTS could save approximately 600 kilograms of fuel used during taxiing from being consumed daily, according to Honeywell and Safran estimates.

Based on standard taxiing procedures for a narrow-body aircraft, the company says the system will save up to 4 percent in block fuel costs and reduce carbon emissions by 75 percent, a particularly important issue at European airports due to EU carbon taxes.

The main advantage of placing the system in the main landing gear is traction. The companies say less than 10 percent of an aircraft's weight is on the nose gear, which makes the landing gear a better place to handle adverse conditions on the ground. (For its part, WheelTug says it has tested its system in less than optimal weather conditions and seen no problem.)

Since the system is situated in the landing gear and represents a structural change to the airframe, the company primarily takes an OEM approach to marketing the system, although it says retrofits are a possibility.

According to a *Wall Street Journal* report published last June, the joint venture has already invested about \$250 million into the concept and built 15 systems that have been put through 3,000 hours of testing.

During the air show last June, the joint venture announced an extended collaboration on the development of the EGTS with AirFrance.

"At Air France," says Bruno Delile, senior vice president, new aircraft and corporate fleet planning for the airline, "we are particularly conscious about energy efficiency. With the electric green taxiing system, we aim to reduce our fleet's carbon footprint at airports, while also decreasing noise and useless fuel consumption."

The joint venture, however, figures it needs to spend at least several times that amount to persuade Boeing Co. or Airbus to install the system on new narrow-body aircraft.

The joint venture's system is due to be commercially available by 2016. 🚀

Electric Green Taxiing System



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## Baggage Handling Developments In Europe

*The industry looks to be shaping up well to meet the future, and all the luggage 3.6 billion fliers will bring.*

By Gareth Evans

**R**ecent forecasts from the International Air Transport Association predict that passenger numbers will grow by an average of just over 5.25 percent per year between 2012 and 2016 – culminating at around 3.6 billion passengers by the end of the period.

With an anticipated 500 million or so new travelers set to fly on domestic routes, and a further 330 million fliers using international services, that all adds up to a lot of additional baggage, too.

Mishandled baggage is already said to cost the industry an estimated \$2.9 billion annually; add to this the growing emphasis on efficiency and improved passenger experience and the case for better baggage handling is clear. Not surprisingly, it has formed a compelling driver for a number of developments and innovations – and European airports have been quick to embrace the benefits that these new technologies can bring.

### 70 MILLION BAGS PROGRAM

Amsterdam Airport Schiphol in particular enjoys an enviable reputation for being swift to adopt novel approaches.

Schiphol routinely deals with between 120,000 and 180,000 bags per day – a total of more than 55 million items a year; in the near future, that could rise to 70 million, if the airport's intentions to expand its market share go according to plan.

With the numbers due to rise – but the physical footprint set to remain the same – there are obvious gains to be made from increasing the operational efficiency of the baggage handling process, and the 70 Million Bags (70MB) program arose in response.

With a budget of around 800 million euro (\$1.071 billion), this massive infrastructure

investment aims to provide the airport with the necessary capacity, reliability and quality of baggage handling service to support its ambitions to become the focus of increased air traffic, and Europe's transfer hub of choice.

A major source of Schiphol's passenger volume comes from transfers, and transfer luggage accounts for around 40 percent of the baggage being handled in any one day – and that poses its own particular problems.

While maintaining the integrity of the chain of connection between passenger and bag is the essence of all baggage handling, the issue becomes orders of magnitude more complex for transfers, when items arriving on one aircraft must be consigned to any number of connecting flights, in limited time. To meet the challenge, the airport opted to go down the route of increased automation, chalking up a number of major "firsts" along the way.

*Due to a growing emphasis on efficiency and improved passenger experience, the case for better baggage handling is clear. Not surprisingly, it has formed a compelling driver for a number of developments and innovations – and European airports have been quick to embrace the benefits that these new technologies can bring.*

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GRENZSBACH AUTOMATION

The "baggage on demand" – or "pull" – concept conceived by Schiphol Airport was implemented by Grenzsbach Automation and Vanderlande Industries and takes a batch approach, buffering bags in a central storage area and then using robots to load ramp-carts and containers automatically, as and when required.

## BAGGAGE ON DEMAND

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batch approach, buffering bags in a central storage area and then using robots to load ramp-carts and containers automatically, as and when required.

Schiphol began using a single robotic loader – the first installation of its kind in the world – in the summer of 2006, subsequently adding a further six in the airport's new South Hall, which was officially taken into service in early 2011. In October of the same year, the system won the inaugural interTERMINAL innovation award at the inter airport Europe conference and trade show in Munich.

"All systems have been operationally in use since then, they work reliably, without any significant problems, and with excellent operational performance statistics," says Dr. Joachim Döhner, Grenzsbach's director of airport logistics.

## RISE OF THE ROBOTS

Robots are making their mark at Germany's largest airport, too. In 2013, Grenzsbach installed one of its fully automated bag-



SWISSPORT INTERNATIONAL

*It is not just behind the scenes, however, that the benefits of the improvement program can be seen; having pioneered a self-service approach to baggage drop-off in 2008, Schiphol has recently extended the idea in response to good reports from its users.*

gage loading systems at Frankfurt Airport, which processes 24 tons of baggage in each eight-hour shift, with loading staff now acting as system operators, not manual laborers.

Although the basic components are essentially the same as at Schiphol, according to Grenzsbach the key to making the robot loading system an individually tailored solution lies in the precise com-

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SWISSPORT INTERNATIONAL



*Swissport will be focusing on improving its existing solutions – working on the likes of providing “web-to-mobile” boarding passes from its own Web check-in application, to be sent either via email or SMS. Home-printed luggage tags are another idea that the company is investigating.*

combination used, coupled with the full integration of the system into the conveying infrastructure and IT systems.

In addition, Frankfurt Airport has now also adopted a fully automated tub inspection line, which robotically cleans and examines the airport's 20,000 baggage carriers, largely using optical measurements to pick up on any faults, and thus plays an important part in ensuring the baggage system runs reliably.

### MUM

Automated solutions are increasingly featured at the other end of the journey, too, with the arrival of the likes of MUM (Mechanical Unloading Module) at Schiphol as part of the 70MB program – a system described by some commentators as marking a huge leap forward in baggage handling technology.

Another world first, at its heart lies a mechanized system capable of lifting, tipping and emptying containers onto a conveyor for processing and sorting – and equipped with state-of-the-art video cameras to enable adjustments to be made as required.

Designed to improve worker safety and improve efficiency, MUM has already demonstrated a 10 percent increase in hourly productivity, and that is expected to increase further as the rest of the planned connecting systems and infrastructure come online in the future.

### SELF-SERVICE

It is not just behind the scenes, however, that the benefits of the improvement



program can be seen; having pioneered a self-service approach to baggage drop-off in 2008, Schiphol has recently extended the idea in response to good reports from its users.

The self-service approach has also started to gain traction in other ways, too; in 2012, Swissport International, in collaboration with partner Sky Assist, linked the concept with e-services and introduced the first-ever self-reporting facility for lost baggage at Geneva International Airport.

Now, passengers missing bags on arrival can choose to enter the details online at a dedicated PC terminal, scanning their boarding pass to simplify much of the data entry, and adding the rest via a touch-screen – and so avoid the hassle and delay of conventional “Lost & Found” desks.

With all the necessary information given, the passenger receives a printout giving the appropriate contact details, an initial status report on the search, and when to expect the missing item to be returned.

The concept – now installed in dedicated kiosks in three other airports and scheduled to be added to more – seems to have gone over well with the travelers, as Roland Kühnelt, Swissport’s Head of Performance Management & Innovation, explains.

Bringing the self-service approach to lost baggage is the logical extension of the wider use of self-check ins and baggage drop-offs, and sits well with the general move within the industry to automate airport processes, and simplify the overall passenger experience.

“For our low-cost customer close to 90 percent of lost and found cases are handled via the online AHL declaration, for other customers the percentage is lower,” says Roland Kühnelt, Swissport’s head of performance management and innovation. “Feedback from passengers is generally positive, but we are always seeking to improve the service and make the declaration easier for them.”

Swissport plans to extend this service to Helsinki-Vantaa Airport and in Spanish stations in due course.

## FUTURE TRENDS

Despite the huge advances over recent years, still more upgrades are planned and new developments are in the pipeline.

Grenzebach, for example, is working on integrating fully automated container transport in their solution, as well as adding further container types to their portfolio of supported loading units.

“We are also working on designing multi-destination loading cells – a loading cell which can support several containers for different destination simultaneously,” Döhner says. “Beyond that, we continue to monitor evolution of 3D sensory technologies, which may help us to further enhance 3D resolution and implicitly positioning accuracy and loading quality.”

For Swissport, in the near future Kühnelt says it will be focusing on improving its existing solutions – working on the likes of providing “web-to-mobile” boarding passes from its own Web check-in application, to be sent either via email or SMS. Home-printed luggage tags are another idea that the company is investigating, looking at how they can adapt their applications to produce them, while also keeping a close watch on the development of possible alternatives, such as permanent bag tags.

“In addition,” Kühnelt says, “there are some very interesting ideas around what we could do, especially in terms of self-service for passengers, such as automatic bag drop or self-boarding gates. Most of these technologies are really useful to improve the passenger experience, by reducing queues and, therefore, the stress from passengers.”

With these and other developments waiting in the wings, the industry looks to be shaping up well to meet the future, and all the luggage 3.6 billion fliers will bring. ✈️

## About the author:



*Gareth Evans spent nearly twenty years developing and implementing commercial R&D, materials-handling, recycling and pollution control programs, gaining experience across a range of industry sectors. He was also involved in a number of feasibility studies under the European Union’s 5th framework program and worked as a consultant on projects in the UK, Europe, Turkey and Australia.*

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*Michael Doane alongside a Douglas TBL 280 Towbarless Tractor on the day he officially "retired" after a 50-year career with Douglas Equipment, 35 of those spent selling and marketing the company's GSE around the world.*



*Above, a Douglas DC 12 tows British Airways' first Concorde flight from London Heathrow Airport. Below, a Douglas DC12-44 tows the airline's last Concorde flight at the same airport.*

## Michael Doane Retires After 50 Years At Douglas Equipment

*Long-standing GSE executive helped introduce towbarless equipment and build the Douglas brand throughout the world.*

*By Steve Smith*



**A**nyone looking for GSE career advice should just ask Michael Doane for his.

"You have joined a great industry in which no two days are the same," he says. "You will face new challenges every day that will test your knowledge and skills and bring you great satisfaction. You will also enjoy working in a very friendly industry that crosses all national, political and economic boundaries and which offers great opportunities and rewards."

The fact that we dug up that gem from an interview *Ground Support Worldwide* did with Doane years ago makes it no less relevant today as we talked with him again about his long career at Douglas Equipment Ltd., Cheltenham, UK.

Earlier this year, Doane accomplished what few of us have by stepping down from his sales and marketing position at his one-and-only employer after traveling the world selling GSE facing those new challenges day after day with no two days alike in a career spanning 50 years.

## APPRENTICESHIP

"They gave an excellent start for a young person," he says by way of explaining his entry with the ground support equipment manufacturer.

Doane joined the company in 1963 as part of a five-year engineering apprenticeship program. Eventually, he became a production engineer in 1968 and moved up the ladder working mainly in design and production until 1974.

From that point, Doane moved into sales becoming a technical sales manager in 1979, general sales manager in 1987 and, finally, sales and marketing director in 1988, which he held until this year.

Thanks in large part to Doane's work developing the Douglas brand, the company now exports 95 percent of its product worldwide to Europe, Scandinavia, North America, Middle East, Southeast Asia, Australia, Russia, China and Japan.

"The GSE industry operates in a very special global niche market that is a very competitive market," he says. "Therefore, winning any order for high-value equipment is a challenge."

**'The GSE industry operates in a very special global niche market that is a very competitive market.'**

## TOWBARLESS CONCEPT

While we don't pretend to be able to sum up a half-century career in a few magazine pages, Doane takes particular pride in growing the company's towbarless concept in the 1990s with its original model, the TBL 180.

"Bear in mind that, certainly in the early days, this was a relatively new way of handling aircraft," he adds. "So the challenge always was to persuade the potential customer that the concept was going to increase operational efficiency, reduce operational costs and increase operational flexibility while protecting the aircraft at all times in a cost-effective way."

Douglas, no stranger to the GSE

industry, was one of the first companies to capitalize on the expanding commercial aviation market when it started manufacturing aircraft towing tractors in 1947.

By the beginning of the 1990s, however, at least two other GSE manufacturers were introducing a new idea – the towbarless tractor. While a bit late to the party, Douglas more than made up for it.

"From the very beginning, we focused on a cost-effective concept and design that could be included across all models in the range we were planning," Doane explains. "We started with the drive line and, after a great deal of research, opted for what we call a conventional drive line with low

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*As chairman of the British Airport Services and Equipment Association, Michael Doane discusses industry issues with Prince Michael of Kent.*

maintenance and repair costs, that is conventional torque converters and power shift transmissions and conventional mechanical drive-steer axles that are the same type of drive lines we use in our conventional aircraft towing tractors.”

The towbarless equipment also featured a unique nose landing gear cradle that enables the tractor to be coupled to the aircraft without moving it.

“Therefore, the coupling/uncoupling procedure can be undertaken at anytime during ground operations,” he says. “It fully supports the aircraft’s NLG under all conditions even if all systems fail.”

Douglas also pioneered the use of an electronically controlled multi-mode steering system and now use CanBus controls throughout its designs.

During this time, Doane traveled extensively throughout the world and grew the company’s global market

share for towbarless equipment to a high of 60 percent in less than five years after the product’s introduction.

“In those early days of the towbarless tractors,” he says, “we had tremendous support from our customer base around the world who were able to give us access to aircraft to enable us to complete the airframe manufacturers’ approval tests with each tractor for each model of aircraft it was designed to handle.”

## MAJOR SALE

Despite his world travels, one of Doane’s first major sales for towbarless equipment was decidedly closer to home.

Following many months of meetings, discussions and technical presentations, British Airways decided to convert its aircraft handling operations at Heathrow and Gatwick airports to towbarless equipment in the mid-1990s,

“This was part of an airline-wide drive to increase operational efficiency, reduce operational costs and increase operational flexibility,” Doane adds. “Towbarless equipment was going to be the key to the airline’s operational goals for its ground operations.”

Doane was able to persuade the airline with “well presented technical presentations, factually based and



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## GSE's Future

We wrapped up our interview with Michael Doane on the question of future trends of GSE. Here’s what he had to say:

- “Going forward green issues are going to become ever more important and, technically, we are going to see more hybrid drive lines and the development of fuel cells and the use of solar power for GSE.”
- “Growing markets to watch are Russia and the CIS states where I think there is huge potential.”
- “South America also has great potential as well as the Indian subcontinent and Africa.”



supported" that the Douglas concept was the right solution. As a result, Douglas received what was at the time the largest order for towbarless tractors ever placed, and included TBL 180s, TBL 280s and TBL 400s.

Douglas' towbarless equipment soon spread throughout the world:

- In the Middle East, for example, Dnata, Emirates ground handling division, was one of the first major ground handling service providers to adopt the towbarless concept.
- A sale of a fleet of TBL 180 towbarless tractors to American Airlines for pushback operations helped the company break into the U.S. market. The American Airlines sale quickly led to substantial orders from Continental Airlines for the TBL 280 and TBL 400 towbarless tractors for maintenance towing operations in Newark and Houston.
- At the same time with the support of Air Canada, Doane gained an introduction into the Canadian market with sales of the TBL 280 and TBL 400.

"I think we are now an established supplier to the North American market having secured orders over the last 10-15 years from many more North American airlines," he says.

Of course, Doane was marketing more than just towbarless equipment in the 35 years he spent in the sales and marketing department. More than 40 percent of the company's production is, in fact, still in conventional aircraft towing tractors.

"And this range of products have also seen great strides in development," he says.

While Doane "retired" last March, he remains a consultant with Douglas. He was also asked to take up the position of honorary president at the British Airport Services and Equipment Association, which helps member companies promote their products and services – and a group he led as chairman for seven years during his busy Douglas career.

"It is an opportunity to stay involved in the industry and give other companies the benefit of my experience," he adds. ✈

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## Focus And Standards Can Prevent Ramp Accidents

*Remaining keenly aware of the potential dangers in our everyday workplace takes not just focus, but training and standardizing best practices.*

By DeborahAnn Cavalcante

**T**here are times when we are doing everything right. Crossing in the crosswalk, for example – **with** the light. We should be able to let our guard down knowing we are safe. But accidents can still happen. Life can find a way to turn things upside down when we least expect it.

And so it is with ground handling. We work in what can be an unforgiving environment each day. Engine exhaust, heavy equipment and flammable fuels can pose more risks than we can count. The old cliché “out of sight out of mind” proves most dangerous since it breeds complacency. The more comfortable we become with the danger, the easier and further from our focus it drifts, and the easier it can be to fall into it.

The first step to take to mitigate these risks is to be aware.

Once the plane lands, and after the engines stop whining, there are areas of risk that require situational awareness at all times. They include marshaling and parking; safety and security of the passengers; servicing the aircraft; aircraft security and fueling.

Some pertinent questions to be considered may be:

- **Who is handling the plane?**
- **Are they properly trained and staffed?**
- **Do they have the proper type and size of equipment for the task to be accomplished?**
- **What is the safety culture like?**
- **Does it tolerate work-arounds and shortcuts?**

In comparison to an aircraft crash it may sound like small potatoes, but direct costs associated with aircraft damage on the apron and in maintenance facilities are upwards of \$1.2 billion a year. Fac-

toring in the indirect costs of the aircraft being out of service, increased insurance premiums, temporary replacement, injuries, and other associated expenses, that number can approach \$5 billion.

But remaining keenly aware of the potential danger in our everyday workplace takes more than just focus. The sad reality is that much of it is preventable with training and standardization of best practices.

### TRAINING

The most significant risk factors for ground damage occur in towing, ramp movements, ground service equipment and hangar movements, which include maintenance facilities and operations.

One common thread running through all of these risk areas is a lack of training. As a manager, the training of employees is paramount to a safe operation. Once training is completed, however, and the employee has demonstrated profi-

ciency at the task, the employee should incorporate a self-assessment as part of every task.

Self-assessment is an excellent tool for determining if standards have been met to accomplish a task. You can eas-



**Once the plane lands, and after the engines stop whining, there are areas of risk that require situational awareness at all times. But remaining keenly aware of the potential dangers in our everyday workplace takes more than just focus.**

ily self-assess by asking yourself the following:

- **Am I properly trained to perform the task?**
- **Am I adequately equipped to perform the task?**
- **Are the tools or equipment I am about to use in good working order?**
- **Do I need assistance to perform the task?**
- **Do I have the appropriate personal protective equipment to keep myself safe?**

### BEST PRACTICES

There are some basic best practices that go a long way in reducing ground

**Remaining safe on the ground is everyone's responsibility.**

accidents and incidents, the foundation of which is to never ask anyone to do a job or task they have not been trained to do. So keep an open door to questions. Be approachable. Teach others to stop if they are unsure, and embrace a re-





quest for assistance. Safety procedures such as the chocking of the main gear at all ramp parking situations or while the aircraft is in maintenance sounds a bit elementary, but this is an area that is subject to being ignored, especially if the aircraft will not be parked for an extended period of time.

Let's take a look at one routine:

#### **MOVING AIRCRAFT.**

- A ground marshaller should be used as aircraft arrive and depart from parking spots. Wing walkers are especially helpful when pulling or backing an aircraft into or out of a hangar.

- An industry best practice tells us that we need two people plus a tug driver when maneuvering the aircraft on the ramp or removing it from a hangar, and three people plus a tug driver when pushing an aircraft into a hangar or tight parking location.
- The use of warning cones at wing tips and tail to avoid wing overlap hazards are considered preventative best practices.
- Confirm with the pilot that the brakes are off before beginning to tow the airplane. A trained person in the cockpit as a brake monitor for heavy aircraft is recommended.
- If you are not familiar with the aircraft type, and have not been properly trained, do not attempt to move the aircraft, leave the aircraft where it is and seek out someone who is familiar before towing.

All of the above can be culminated in an integrated and comprehensive safety program for the entire organization.

It may not be possible to eliminate all

## The 5-Second Rule

One way to check yourself and your situational awareness of danger and risk is to learn to use the 5-second rule: Before you begin any task, ask yourself:

*What harm or damage could result from my actions?*

This is yet another great self-assessment tool that does not cost time or money, but pays priceless benefits.

risk as it is inherent in what we do, and the tools and equipment we use to do it, but documenting procedures establishes expectations and sets standards for operational behavior. Furthermore it provides a framework with which to measure accountability and strive for continued improvement.

Remaining safe on the ground is everyone's responsibility. ✈️

## About the author:



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



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## Maintenance Tips For GPUs

*Wiring ... filters ... connections .. fins ... sensors ... belts. There's no shortage of what to look for on your GPU's next PMI.*

*By Kenneth DeVolpi and Jason Chapman, Matheson Flight Extenders*

**W**hen it's time for your GPU to head to the shop for a PMI, there are a lot of areas to be inspected.

For example, if it has been more than 300 hours since the GPU's last inspection, oil filter, and fuel filter changes are in order. The air filter should also be removed

from the housing and checked. If it is very dirty, it should be replaced.

- Other items should be inspected on the engine as well. Wiring, connec-

tions, and sensors should be checked for tightness and bare spots.

- If your unit uses an electronic actuator to operate the governor, all linkages should be checked for binding and lubricated as needed.
- Accessory belts should be checked for tightness and cracking.
- Intake hoses and exhaust piping should have all clamps checked for tightness. Batteries should be checked for proper electrolyte levels. The terminals and cables should be clean and tight.
- Engine mounts should be tight and the isolators should be free of cracking and distortion. The engine should be checked for any oil leaks as well.

### COOLING SYSTEM

The GPU's cooling system is very important due to the long hours it will typically run. The coolant level, of course, should be kept full with a 50/50 antifreeze and water mixture. If the system uses an overflow tank, it should be kept at just below half-full.

- The radiator cap should be the correct pressure for the system and be free of cracks in the rubber seal. Radiator fins should be clean and straight.
- A thorough pressure wash will usually go a long way to help cooling efficiency. All cooling hoses should be checked for leakage and all clamps checked for tightness. If there is any green staining in the radiator fins, then there is a leak. A pressure test would be the next order of business.

### CHASSIS

Next on the list should be an inspection of the GPU chassis and running gear.

- The brakes should be checked for proper operation and adjustment.
- Tires should be checked for proper inflation and wear. If the front tires are wearing unevenly, the alignment and toe settings should be checked.







**If it has been more than 300 hours since the GPU's last inspection, oil, oil filter, and fuel filter changes are a given. But there are many other areas to check.**

- The tow bar requires attention, too. It should not have any excessive "side play" and the latch should lock the tow bar firmly in place.
- Wheel bearings need to be cleaned, inspected, and repacked every 2,000 hours or two years, whichever comes first.

## GENERATOR

Now for the fun stuff – the generator system. If the output of the GPU is not set to exact specs, the aircraft will not accept power.

Let's take a look at the type of GPUs commonly used for commercial aircraft. These units put out 120V AC at 60Hz. The generator typically has at least a 90KVA rating for a single cable unit and a 120KVA or more rating for a dual cable machine. These units operate at 400Hz, which directly corresponds to engine and generator RPM.

All of these parameters are fully adjustable. By raising or lowering engine RPM, the frequency can be changed to be set to the proper level. Since the setting should be 400Hz plus or minus 5Hz, the aircraft typically will not accept power outside these parameters.

The voltage is adjustable as well. Anywhere from 110V AC to 120V AC is the target area. If the voltage is too high or low, the safety relay in the aircraft will open causing the GPU contactor to open. This in turn will interrupt power output. You may find that some aircraft operate more happily and without interruption at an exact voltage setting. We have found that newer aircraft are definitely more picky in this regard than older ones. A little experimentation may be in order to find a happy medium that your

customer's aircraft will work with.

A very handy tool to have during an inspection is a load bank. This machine will help fine-tune your unit to the proper specs and ensure your GPU can handle any load an aircraft requires.

A good working 90KVA GPU can hold at least a 180 amp load for 10 minutes or more. This test is also good for the GPU because it gets the exhaust very hot and burns out accumulated carbon and soot.

## COMPONENTS

Once the unit operates correctly, it is time to test and inspect the generator components.

The main cause for GPU power inter-

ruption is a worn-out cable plug. The plug should be checked for scrapes and abrasions due to being dragged on the ground. This will cause a loose plug connection.

The terminals inside should be checked for wear and roundness. The cable itself should be checked for cuts and abrasions.

If the contactor is not a sealed unit, remove the cover and check the contact surfaces. If any pitting is evident, it can be quickly repaired with fine sandpaper and contact cleaner.

And finally, all wiring should be checked and the generator should be clean and free of debris. ✈️

## About the authors:

*Kenneth DeVolpi, manager of sales and marketing and special projects, 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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# PRODUCT PROFILE

UPS Airlines placed an industry-first order for 1,821 fire-resistant shipping containers. The unit load devices will enhance safety on board the company's global fleet of cargo aircraft.

UPS Airlines

## UPS Begins Using Fire-Resistant Cargo Containers

*New ULDs can contain fires with temperatures of 1,200 degrees for four hours and give pilots a chance to land stricken aircraft.*

*By Steve Smith*

**U**PS Airlines placed an industry-first order for more than 1,800 new fire-resistant cargo containers capable of containing intense fires for four hours, and announced other fire-safety initiatives following a report that linked the fatal crash of one of the company's 747s to a shipment of lithium batteries that caught fire.

"These containers are a game changer, both for UPS and the industry as a whole," said UPS Chief Operating Officer David Abney. "They represent a quantum leap forward in safety, an area where UPS places the highest emphasis."

The MACROLite containers, built by Macro Industries, Huntsville, AL, are made from a fiber-reinforced plastic composite.

Burn testing conducted by UPS and the Federal Aviation Administration,

and observed by the National Transportation Safety Board, has shown that a ULD with MACROLite panels can contain a fire with a peak temperature of 1,200 degrees Fahrenheit for more than four hours.

"That time frame would give a flight crew ample time to land safely in the event of an in-flight fire," the airline said in a press release.

### DUBAI CRASH

Time was a crucial factor for the crew aboard UPS Flight 6 as it left Dubai International Airport on Sept. 3, 2011 en route to Cologne Bonn Airport. The crew reported smoke in the cockpit just 20 minute after takeoff and returned to Dubai for an emergency landing.

As more smoke filled the cockpit and equipment failed, the plane was too high on its initial approach to the airport. The plane was turning back for another ap-

proach when it crashed near a military base, killing Captain Doug Lampe and First Officer Matthew Bell.

UPS made the ULD announcement one day before the United Arab Emirates' General Civil Aviation Authority released a 322-page final incident report that confirmed a shipment of lithium batteries caught fire and caused the crash.

According to the report, the GCAA found "with reasonable certainty" that the fire originated from "an element" of the cargo that contained, among other items, lithium batteries.

The authority worked with UPS, Boeing, the National Transportation Safety Board and the Federal Aviation Administration in its three-year investigation.

"It is possible that a lithium-type battery or batteries, for reasons which cannot be established, went into an energetic failure characterized by thermal runaway and auto ignited, starting a



chain reaction which spread to the available combustible material," said the GCAA report.

## NEW ULDS

Delivery of the new ULDs for UPS will begin this month and is expected to be completed by early 2014.

About 75 test containers have already been evaluated on more than 5,600 trips during an eight-month period.

"We have tested these containers in the laboratory and in live operations," said UPS Airlines President Mitch Nichols. "They will enhance safety and increase durability, and they are lighter, which will reduce fuel burn and supports our ongoing sustainability efforts."

The new containers are the latest in a series of fire safety enhancements recommended by a joint safety task force run by UPS and the Independent Pilots Association, the union that represents UPS' pilots.

"As UPS pilots, we are determined to do everything in our power to minimize the risk associated with on-board smoke and fire events," said IPA president Robert Travis. "This includes proper regulations governing the carriage of hazardous materials [such as] lithium batteries."

Other measures include the following:

- **FIRE-CONTAINMENT COVERS FOR CARGO PALLETS:** UPS purchased 575 of the covers, which can contain a 1,200-degree fire for four hours.
- **FULL-FACE OXYGEN MASKS:** UPS has already installed these masks, which can be easily put on with one hand in three seconds on its 747s



## NTSB: Fire Suppression Systems Urged In All Cargo Planes

**Current FAA regulations require halon gas fire suppression systems in below-deck cargo holds, but not in the main cargo compartment above deck.**

Last November, the National Safety Transportation Board announced that the Federal Aviation Administration should require fire suppression systems in all cargo containers or compartments of planes to protect against the type of fires that can be triggered by shipments of lithium batteries.

"These fires quickly grew out of control, leaving the crew with little time to get the aircraft on the ground," NTSB Chairman Deborah Hersman said in a statement. "Detection, suppression and containment systems can give crews more time and more options; the current approach is not safe enough."

Current FAA regulations require halon gas fire suppression systems in

below-deck cargo holds, but not in the main cargo compartment above deck.

The main strategy for fighting fires above deck is to deprive them of oxygen by taking the plane to an altitude where depressurization is achieved. In addition, FAA rules say airplane fire warning systems must be able to detect fire in a cargo container within a minute of its ignition.

But the NTSB said its tests of two types of cargo containers showed a time lapse between ignition and detection ranging from 2 1/2 minutes to more than 18 minutes.

In the tests, the fires "grew very large, capable of causing significant damage to an aircraft" before they were detected, the letter said.

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# PRODUCT PROFILE



Fire-resistant ULDs are just a part of UPS Airlines' plan to enhance air cargo safety. The UPS-Independent Pilots Association Safety Task Force collaborated with the NTSB, FAA and industry safety experts to research and implement other safety measures outlined in this infographic.

and MD-11s. The masks will be installed throughout its fleet by next year.

- **EMERGENCY VISION ASSURANCE SYSTEM (EVAS):** UPS has completed installation of this inflatable cockpit vision system on its 747-400 fleet. The system enables pilots to see their instruments and out the cockpit window even when smoke is present. Other ongoing efforts to enhance fire safety include the following:
  - Enhanced training for fire-related emergencies, as well as enhanced customer and employee training on hazardous material shipping.
  - FAA certification for an in-container fire suppression system.
  - Advocating for harmonization of domestic and international shipping regulations.
  - Research and testing of fire-resistant collapsible containers. ✈️

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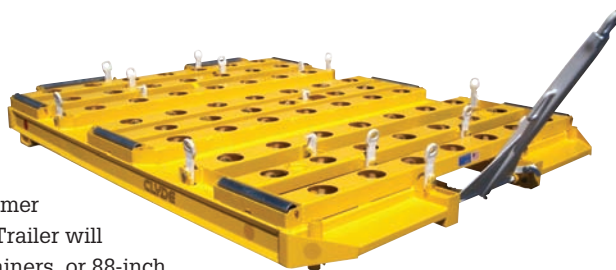
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## Cargo Trailer Clyde Machines Inc.

The 15F2862 15,000-pound capacity trailer has a new recessed frame to protect customer markings. This Covered Pallet Trailer will hold LD 1, 2, 3, 4, 7, and 8 containers, or 88-inch x 125-inch, 96-inch x 125-inch and 88-inch x 108-inch pallets. Also in the protection package are protected cross members for the casters and side pockets for the rollers.

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## Self-Propelled Loader Trepel Airport Equipment GmbH

Trepel Airport Equipment GmbH has designed the CHAMP 300 pallet/container loader that is a self-propelled unit designed to handle containers and pallets up to 20 feet in length and a maximum of 30 tons. The 300 is capable of operating with a bridge platform height between 2 and 5.6 meters and can service main and lower deck compartments of a Boeing 747, DC-10, L-1011, and A300 aircraft.

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# PRODUCT HANGAR



## Five Power Options

### NMC-Wollard Inc.

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

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## Rollertrack System Power Stow A/S

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

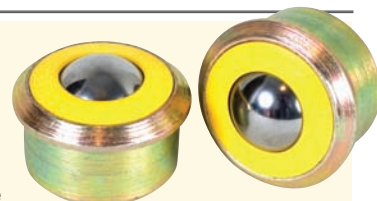


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## Ball Transfer Units

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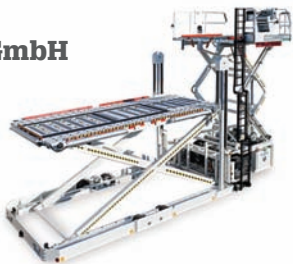
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## Main Deck Loader

### SCHOPF Maschinenbau GmbH

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## Fire-Resistant Cargo Containers

### AAR Corp.

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

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## Container Trailer

### Accessair Systems Inc.

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2003 Harlan HTAG-80 Ford gas 8K DBP, w/cab (2 avail)  
1997 Toyota, Model 2-02TD25 diesel engine.

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

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Steve Smith

## A Green Ramp

*New system at Sea-Tac puts 'green' into preconditioned air.*

*By Steve Smith*

**M**uch of the "green" news that lands on our desk has more to do with a newly constructed terminal. Water-saving toilets and energy-saving HVAC systems aren't all bad, we suppose, but it definitely makes our day when we find an airport trumpeting a green ramp initiative.

Last month, the Seattle-Tacoma International Airport went online with a PCA system that is expected to save airlines more than \$15 million in annual fuel costs and reduce the airport's carbon footprint by 40,000 metric tons each year, too.

The airport built a centralized plant to deliver PCA through 15 miles of pipe to each of the airport's 73 jet gates. The central plant houses four 750-ton chillers that fill 16 ice storage tanks with ethylene-glycol solution cooled by electricity furnished by the airport. Four secondary pumps circulate the chilled liquid through pipes to the gates for cooling.

Alternately, the airport's steam plant heats water that is piped to gates for heating. A heat exchanger at the gate directs the conditioned air through a telescoping duct on the jet bridges, to a ventilation hose and directly into the aircraft's cabin.

In addition, Sea-Tac obtains about 90 percent of its power from hydro-electric dams and 10 percent from renewable energy and nuclear sources. Both the cooled and heated air generated from PCA, therefore, emits substantially less pollution than the jet fuel in the aircraft's auxiliary engines.

What's more, Sea-Tac took advantage of the largest federal grant of its kind to offset the costs of the \$43 million project. Nearly \$22 million is covered by Voluntary Airport Low Emissions Grants from the Federal Aviation Administration. Airport Development Funds,

which come directly from fees charged to airlines, will pay the remainder. These fees will be offset by decreasing operating costs for a projected payback for the project in less than three years.

After first hearing the news, we posted a link within our ever-growing *Ground Support Worldwide* LinkedIn Group. One astute member wondered how the system controlled the flow and temperature for different sized aircraft.

"At the ramp level, connected to the jet bridge is a control for the hose hook-ups," Perry Copper, the airport's media and public affairs manager, reported back to us. "There are three settings: Wide Body, Narrow Body and Regional. The ramp handler selects which is appropriate for the aircraft at hand."

For larger aircraft there are two hoses that can be hooked up (757, 767, 747, 777, 787, A330, A340).

"Each gate is set up for the type of aircraft that could be at that gate," Copper adds. "The hot and cold going into each of the air handlers at the gate are constant. The aircraft will then meter how much heating and cooling it needs."

A handwritten signature in black ink, appearing to read 'Steve Smith'.

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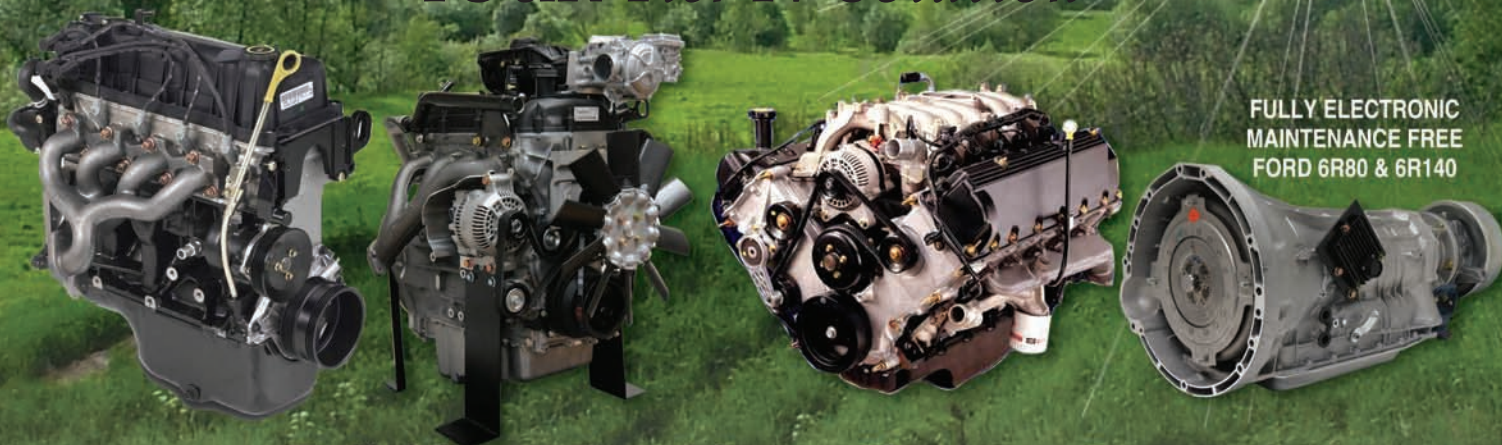
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