SUPPORTING AVIATION FROM THE GROUND UP

GROUND SUPPORT WORLDWIDE

WASP'S NEW STANDARD DOLLY

2015 GROUND SUPPORT PRODUCT LEADER

Versatility is just one of the key benefits of our magazine's product of the year that is designed to do the job of many other types of containers and pallets.

INTERNATIONAL

If You Want To Improve The Safety Of Ground Handling, Look To How It's Done On An Aircraft Carrier

In simple terms, aircraft ground handling should be thought of as a system, one which needs proper analysis and design instead of analyzing operational risks in an overly simplistic fashion. Page 12

APRIL 2015

AviationPros.com

DOWNLOAD THE LATEST EDITION!

GSP

ground service provider

Sponsored by:

Global Aviation SERVICES

The GSP App, which stands for "Ground Service Provider," is a FREE, digital-only publication for tablets created by *Ground Support Worldwide*. The GSP App features exclusive and interactive content published only in the App, including: photos, videos, and internal links to websites.

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

Download on the App Store

GET IT ON Google play

Note: The GSP App is available to download for Apple and Android™ tablets only, not compatible with smartphones.
Apple, the Apple logo, and iPad are trademarks of Apple Inc., registered in the U.S. and other countries.
App Store is a service mark of Apple Inc. Android is a trademark of Google Inc.

April 2015 - Volume 23 Issue 3

GROUND SUPPORT WORLDWIDE

Editor **Steve Smith**
920.563.1644 steve.smith@AviationPros.com

Associate Publisher/ Sales **Missy Zingsheim**
920.563.1665 missy@AviationPros.com

Classified Advertising **Michelle Scherer**
920.568.8314 mscherer@AviationPros.com

International Sales Manager **Lutz Krampitz**
+49 0 203 456 82 66 fax +49 0 203 456 85 38
info@krampitzVv.de
Germany, Switzerland, Austria, Turkey, Scandinavia

International Sales Manager **Stephanie Painter**
+44 1634 829386 fax +44 1634 281504
Stephanie@painter-lowe.com
United Kingdom, France, Netherlands, Spain, Ireland, Italy

List Rental **Elizabeth Jackson**
847.492.1350 ext. 18 **ejackson@meritdirect.com**

Production & Circulation

Art Director **Rhonda Cousin**

Media Production Rep **Carmen Seeber**
920.568.8373 carmen.seeber@AviationPros.com

Circulation Manager **Debbie Dumke**
Production Director **Steve Swick**

GSE Expo Worldwide

Trade Show Director **Sue Ralston**
920.563.1655 sue@AviationPros.com

Published by:

CYGNUS BUSINESS MEDIA

CYGNUS AVIATION

Cygnus Aviation, Technology and Transportation Group

Gloria Cosby – Executive Vice President

Gerry Whitty – VP, Marketing

Larry Greenberger – Group Publisher, Transportation Group

Brett Ryden – Publisher, Aviation Group

Lester Craft – Director of Digital Business Development

Cygnus Business Media

Paul Bonaiuto – CEO

Chris Ferrell – President

Ed Tearman – CFO

Eric Kammerzelt – VP, Technology

Ed Wood – VP, Human Resources

Curt Pordes – VP, Production Operations

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

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

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

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

Canada Post: PM40612608. Return undeliverable Canadian addresses to: Ground Support Worldwide, PO Box 25542, London, ON N6C 6B2. Canadian GST #842773848.

NBAA NATA PRINTED WITH SOY INK

CONTENTS

COVER STORY

INTERNATIONAL/FEATURE

DEPARTMENTS

COLUMNS

IN THE NEWS

Major Events in 2015

APRIL 13-15
GSE Buyers & Ramp Ops Conference
Milan, Italy

APRIL 26-29
IATA 28th Ground Handling Conference
Istanbul, Turkey

JUNE 7-10
AAAE 87th Annual Conference & Expo
Philadelphia, PA

OCTOBER 8-11
inter airport Europe
Munich, Germany

NOVEMBER 17-19
NBAA Business Aviation Conference & Exposition
Las Vegas, NV

Business Buzz

GAT Airline Ground Support, based in Mobile, Ala., was named Delta Air Lines' Woman-owned Business of the Year as part of the airline's annual Supplier Diversity Star Awards. Beginning as the first FBO in Mobile, GAT offers a broad portfolio of ramp services at locations throughout the United States.

American Aero FTW, an FBO at Meacham International Airport in Fort Worth, Texas, became the first FBO in the Western Hemisphere to be issued an International Standard for Business Aircraft Handling (IS- BAH) certificate, a rigorous new safety and ground handling accreditation from the International Business Aviation Council. IS-BAH is a global, voluntary code of best practices for the FBO and business aviation handling agent communities.

Swissport International Ltd., reported total revenue and other operating income of CHF 2.9 billion for the year 2014, an increase of 38 percent. The biggest impact on Swissport´s 2014 results was the successful integration of Servisair, which it acquired in 2013. As a result, Swissport strengthened its overall market share, became the largest ground service provider in the UK and Ireland with operations at more than 30 airports, and further increased its footprint in LATAM by being present in 10 countries in the region. In other news, Swissport Tanzania posted a net profit gain of 78 percent. Swissport is the biggest ground service provider in the country. The handler attributed the robust performance to increased traffic, use of wide body aircraft by airlines and more important - enhanced operational efficiency and strict cost control.

Passenger traffic at **Seattle-Tacoma International Airport**, which increased at a pace last year swift enough to make it the nation's fastest-growing major airport, is continuing to climb this year at an even faster pace. The number of domestic and international passengers handled at the airport in January, the latest month for which statistics have been published, grew by nearly 301,000 in January, an increase over the same month in 2014 of 11.92 percent.

John Menzies said profits in the year ahead will be hit by the costs of dealing with the closure of terminals at Heathrow, as the airport services and newspaper distribution group reported a slump in annual pre-tax profits linked to "operational difficulties" at the UK's largest airport. The Menzies Aviation division reported a 45 percent slump in operating profits despite a 4 percent increase in revenues after the firm won more contracts.

The Federal Aviation Administration proposed a $105,500 civil penalty against Servisair LLC of Las Vegas for allegedly violating drug and alcohol testing regulations. The FAA alleges the ground service provider failed to administer drug and alcohol tests to the minimum required percentage of employees in 2013. The FAA further alleges the company failed to add five employees to its random testing pool for weeks or months after they completed their ground coordinator

Advertiser's Index

training. Additionally, the FAA alleges that Servisair failed to distribute its drug-use policy, and failed to display and distribute educational material and an employee assistance hotline number following a move to a new terminal.

The Oregon Occupational Safety and Health Division is investigating a complaint against Prospect Airport Services. In their complaint, workers cited health and safety risks that included exposure to potential falls, blood-borne pathogens, electrical hazards, lack of protective equipment and unsafe transportation conditions.

ProFlo Industries LLC has joined the aircraft refueling industry as an original equipment manufacturer. Started in 2014 by Terry N. Bosserman, ProFlo Industries specializes in the manufacturing and refurbishment of aircraft refueling equipment as well as other fuel storage and dispensing equipment. ProFlo Industries offers products including Jet and Avgas refuelers, hydrant dispensers, towable hydrant carts, fueling skids, fueling ladders and refueler and hydrant modules for in-country integration. The company recently purchased a new facility in Alvada, Ohio. For more information about ProFlo Industries, please visit www.profloind.com or email info@profloind.com.

For the second time in the past three years, the **Air Transport News Awards** recognized SITA, as IT Company of the Year. The 2015 award was based on SITA's influential leadership and innovation, new solutions and achievements, social responsibility, financial performance and contribution to the air transport community.

For the sixth consecutive year, **Southwest Airlines Cargo** is celebrating being named the Airfor-

warders Association's "Domestic Carrier of the Year." The airline also earned the Express Delivery and Logistics Association's awards for "Domestic Airline of the Year" for the 15th year in a row, as well as "Excellence in Web & Technology."

United Airlines is experimenting with prototype boarding areas at O'Hare International Airport with the aim of making the time passengers spend waiting for a flight more comfortable and productive at its gates there. United has changed passenger seating areas and gate-agent podiums, while adding standing work stations and boarding poles to bring more order to the boarding process. The airline also added mood lighting and a proprietary scent pumped into the jet bridge walkways to provide an olfactory experience while boarding.

A new baggage handling report from **SITA** says the aviation industry has cut the rate of mishandled bags by 61 percent globally since 2007 resulting in $18 billion in total estimated cost savings. The SITA 2015 Baggage Report showed that the rate of mishandled bags in 2014 was 7.3 bags per thousand passengers, down from a peak of 18.88 bags per thousand passengers in 2007. This decline comes despite a significant rise in passenger numbers over the same time period, peaking at 3.3 billion passengers in 2014.

NEW DEALS

Dnata has strengthened its commitment to the Philippines with the opening of a new lounge at Manila's Ninoy Aquino International airport and a service center in Clark. The ground service provider first entered the Philippines in 1998, with a team of 80 providing ground handling services to one cargo airline. Since that time, the company has continued to grow and now employs more than 300 people between its airport operations and service center.

ADELTE recently secured two contracts for more than 60 PCAs, with 42 of the company's Zephir units go to Incheon International Airport and 20 to Palma de Mallorca Airport.

Show organizers have added a third hall for the **inter airport Europe 2015**, Oct. 6-9 at the Munich Trade Fair Centre. "More than half a year ahead of the show the available stand space in halls B5 and B6 had already been booked or reserved, while the demand for stand space continues to be very strong. With the directly neighboring hall B4 we are now able to offer additional stand space in the indoor area of the exhibition," explains Nicola Hamann, managing director of Mack Brooks Exhibitions. Currently some 460 exhibitors from 37 countries cover a net exhibition space of more than 25,000 square meters indoors and outdoors.

FCX Systems, Inc., won the contract to manufacture 110 custom GPUs that will be part of the largest foreign arms sale in U.S. history. The GPUs, scheduled for delivery through 2018, provide both 400Hz and 28 VDC ground power to fighter aircraft, which will be operated by a Middle Eastern ally.

Archer Daniels Midland Company and **Clariant** announced the introduction of ADM Evolution Chemical's line of biobased propylene glycol into Clariant's Safewing® and Octaflo™ brands of aircraft deicing fluids in North America. ADM's propylene glycol meets existing industry standards and can be used interchangeably with petroleum-derived propylene glycol. Safewing and Octaflo products made with ADM's biobased propylene glycol fulfill all performance expectations and reduce carbon footprint.

DatcoMedia has signed Virgin Australia and JetBlue for all their GSE software maintenance needs, and has also just added ABR a Australian-based GSE support company which will be using EBis GSE Express for all of dnata's GSE equipment for their maintenance needs.

United Airlines' pilots on the Airbus A320 and Boeing 737 fleets will stop starting the APU after arrival to save money. The shift, which is coming in stages, is a return to an operating procedure used by United in the mid-2000s, before its merger with Continental Airlines. As part of the change, most narrow-bodies will arrive at the gate with the No. 1 engine continuing to run until the aircraft is attached to ground power.

PEOPLE

Swissport International

Ltd., promoted **Nils Pries Knudsen** to executive vice president Global Cargo Services. Knudsen joined Swissport in January 2009 and has since been instrumental in taking the Cargo Division forward to become a global leader. With 4.1 million tonnes of air cargo being handled per year, the cargo division is the ground service provider's second largest service besides ground handling. Knudsen will also become a member of Swissport´s Group Executive Management.

Landmark Aviation has named **Isaac Lee**, its 2014 General

Manager of the Year. This is the second consecutive year that Isaac has received this distinction. In 2014, Isaac, the company's general manager at Miami International Airport, not only increased the success of his FBO location, but also extended his service to the residents of Miami. Isaac was recently appointed to the Miami Dade College School of Aviation's advisory committee. He has also continued to be an active member of the Greater Miami Convention and Visitors Bureau, the Florida Aviation Business Association, and a strong supporter of the Ronald McDonald House Charities of South Florida.

FlightSafety International appointed **Kyle Davis** as its executive director of marketing for the company's business and commercial aviation training activities. His responsibilities include working with FlightSafety's team of product directors to develop new programs, services and solutions that meet the current and future needs of operators of business and commercial aircraft. He also contributes to FlightSafety's market analysis, forecasting, and strategic planning efforts. He has held a number of positions of increasing responsibility since originally joining FlightSafety in 1997. He left the company in 2006 to join EE International in Nairobi, Kenya as regional director for East Africa and then Global Connections as international director. Upon his return to the United States in 2011, Kyle joined LL Johns & Associates as an aviation insurance account executive. He returned to FlightSafety in 2012 as a product director.

WASP'S NEW STANDARD DOLLY: 2015 Ground Support Product Leader

Versatility is just one of the key benefits of our magazine's product of the year that is designed to do the job of many other types of containers and pallets.

By Steve Smith

Anyone looking for a dose of enthusiasm about the future of the GSE industry couldn't have done any better than to visit Booth 409 at our magazine's recent GSE Expo Worldwide trade show in Las Vegas last March.

At the WASP Inc. exhibit space, visitors could luxuriate in "First Class" treatment that included plush airliner seats and a buffet on both days. But even if creature comforts weren't enough, we left feeling positively upbeat after talking with the collection of company executives about sales within an industry that's weathered the economic worst and could be headed for better times ahead.

"I think airlines and ground service providers are finally getting ready to make some orders for new equipment that's meant to replace equipment that has been in service a very long time," says CEO Dane Anderson.

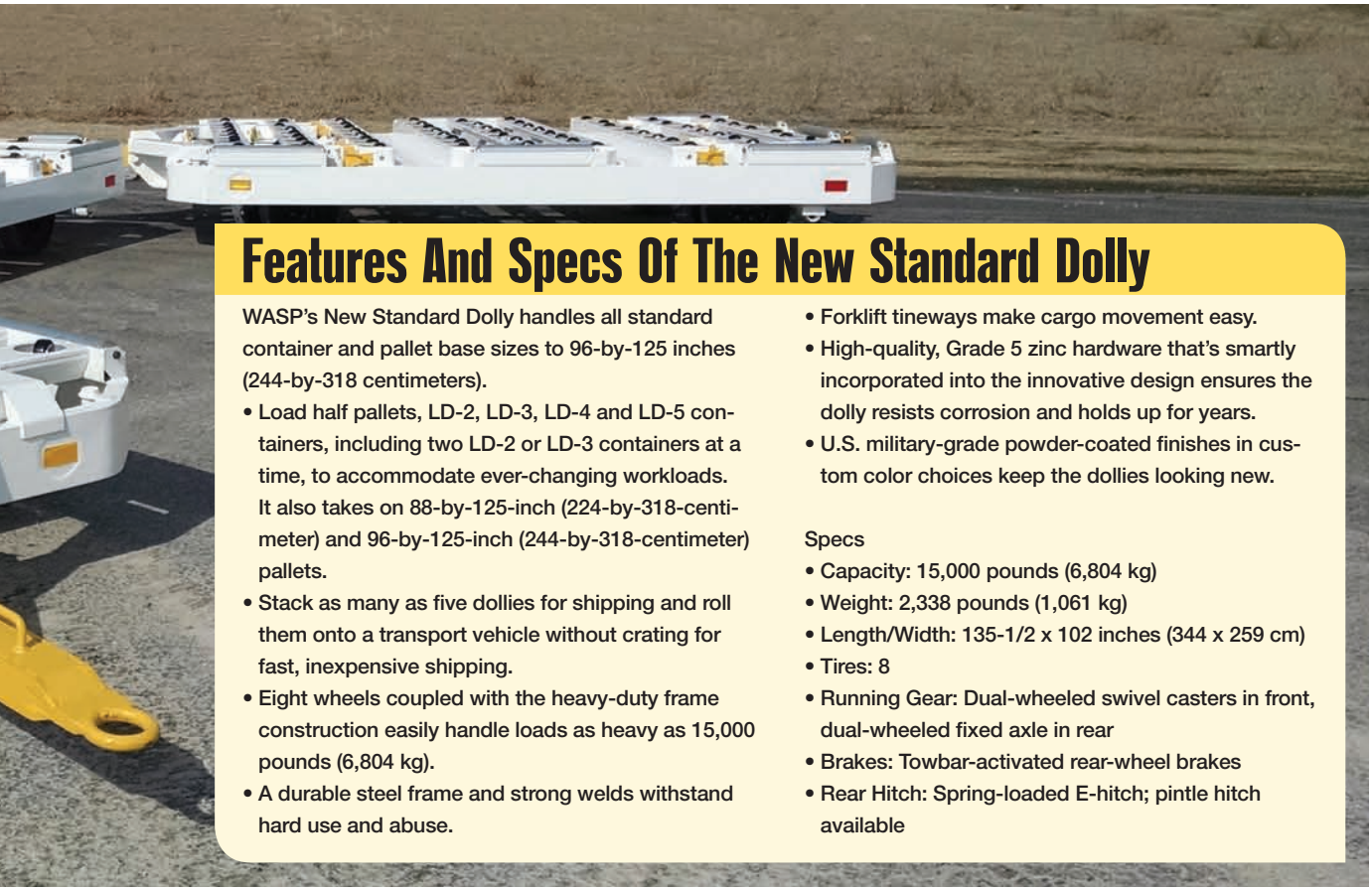
And not just "some" orders, but big numbers. While any sale is a good sale, WASP, like many other GSE manufacturers, has had to make due with the spot buy of a truckload of equipment, say ten to 15 units, and in select areas to boot. Now the talk is turning to volume buying of 100 or 200 units per order and much of this buying is spread around the country. As a result, WASP is gearing up with added manufacturing space and employees to meet a growing demand for GSE.

NEW STANDARD DOLLY

While the world's largest manufacturer of non-powered GSE makes a number of pieces of equipment, we selected The New Standard Dolly as our magazine's Product Leader of the Year.

Due to the many types and combinations of containers and pallets it can handle, one New Standard Dolly can replace multiple dollies with various capacities. The result is greater efficiency for fleets.

"The New Standard Dolly is the result



Features And Specs Of The New Standard Dolly

WASP's New Standard Dolly handles all standard container and pallet base sizes to 96-by-125 inches (244-by-318 centimeters).

- Load half pallets, LD-2, LD-3, LD-4 and LD-5 containers, including two LD-2 or LD-3 containers at a time, to accommodate ever-changing workloads. It also takes on 88-by-125-inch (224-by-318-centimeter) and 96-by-125-inch (244-by-318-centimeter) pallets.
- Stack as many as five dollies for shipping and roll them onto a transport vehicle without crating for fast, inexpensive shipping.
- Eight wheels coupled with the heavy-duty frame construction easily handle loads as heavy as 15,000 pounds (6,804 kg).
- A durable steel frame and strong welds withstand hard use and abuse.
- Forklift tineways make cargo movement easy.
- High-quality, Grade 5 zinc hardware that's smartly incorporated into the innovative design ensures the dolly resists corrosion and holds up for years.
- U.S. military-grade powder-coated finishes in custom color choices keep the dollies looking new.

Specs

- Capacity: 15,000 pounds (6,804 kg)
- Weight: 2,338 pounds (1,061 kg)
- Length/Width: 135-1/2 x 102 inches (344 x 259 cm)
- Tires: 8
- Running Gear: Dual-wheeled swivel casters in front, dual-wheeled fixed axle in rear
- Brakes: Towbar-activated rear-wheel brakes
- Rear Hitch: Spring-loaded E-hitch; pintle hitch available

of a number of lessons we've learned over the years to make a reliable, high-quality product," says DeWayne Nelson, vice president of sales and who's been with the company for 20 years, "and specifically what our customers requested from the equipment."

It goes without saying that any type of GSE needs to be built tough. In the case of the dolly, it had to be strong enough to transport the loads, but also withstand the punishment of life outside on the ramp.

"From the information we gathered from site visits and customer input," says Kevin Hanson, senior account executive and a company veteran of 34 years, "we always heard a few different items come up as focal points for any design changes we were going to make going forward."

Those concepts "commonality," "multi-function," and "mixed fleet," all come down to the versatility and durability built into the New Standard Dolly.

VERSATILE, DURABLE

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.

Company executives gather with their 2015 Ground Support Product Leader award at the WASP booth during our recent GSE Expo Worldwide trade show.

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 perimeter 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.

Like all of its equipment, WASP builds the New Standard Dolly with premium components, specialized manufacturing equipment and welds by certified welders. The company also conducts rigorous quality testing, such as washboard-track testing, to ensure durability, long life, and the lowest total cost of ownership in the GSE industry. In addition, WASP designed the New Standard Dolly with

Company History

In 1979, Jim Watkins started WASP, Inc. for "Watkins Aircraft Support Products" in Alexandria, MN.

Back when *Ground Support Worldwide* was celebrating its 20th anniversary with a history of GSE a few years ago, we found a news article published in 1981, in which Watkins says, "Our first year of business we had just one customer, now we have 10. We feel we can provide a lot of jobs and bring other investment money into our community."

By then, annual sales were around $280,000. One year later, sales topped $1 million. Jim turns out to be right about those jobs - currently, six employees have each worked at WASP for 30 years. Watkins ended up building another plant in Nebraska. By 1996, sales grew to $33 million, and Jim later sold the company to his employees in 1997. The company remains owned by more than 350 employees and has shipped hundreds of thousands of products to 65 countries.

numerous features that further enhance reliability and safety, such as roller guards and sealed casters.

QUICK TURNAROUNDS

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 inventory for quick fulfillment.

While much of this standardization is a natural plus to a manufacturer, this quick turnaround time to make and ship orders is just as much a benefit to customers these days.

"The added value in all the ideas that went into creating the New Standard Dolly is that one piece of equipment can take care of all the container sizes that very common in the industry," Hanson explains, "and by making this a common design we can now quickly react to short lead times for orders."

That standardization is a vital key to supplying customers these days.

"Probably one of the biggest driving factors is that a ground service company has to have all the required equipment within 30 to 45 days after they've picked up a new contract for business," Nelson adds. "That lead time is considerably shorter than it used to be."

For a manufacturer, there could easily be two weeks cut from this time frame after the customer selects the vendor. That can give WASP less than a month to deliver the order.

In addition, 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.

DeWayne Nelson, vice president of sales, was on hand to accept the company's Ground Support Product Leader award.

If You Want To Improve The Safety Of Ground Handling, Look To How It's Done On An Aircraft Carrier

In simple terms, aircraft ground handling should be thought of as a system, one which needs proper analysis and design instead of analyzing operational risks in an overly simplistic fashion.

By Mario Pierobon

The issue of aircraft ground damage is a significant and wide-spread concern among airlines and ground handling companies. And with a disproportionate amount of personnel injuries happening to ground crews when compared to air crews, most ground handling safety professionals do find themselves dealing with a certain degree of anxiety from time to time.

Undoubtedly, a ground service provider may address one salient part of a safety issue, but do so in a way that misses some other just as important part of the puzzle. And, as we all know from this business, there are many more parts of the puzzle than just two.

As such, what gets accomplished ends up by default to be limited in scope. A main problem with a lot of safety "pro-

grams," therefore, is that they are just that – a program that might address one aspect of the overall issue without addressing all of it.

SYSTEMATIC APPROACH

The good news is that new ways of managing safety that indeed consider it in a thorough, systemic fashion have been conceived in academia, found their first applications even within the aviation industry, and carry the potential to further improve safety.

Safety scientists such as Sidney Dekker, Erik Hollnagel and Nancy Leveson say that the models of hazard control currently used in the industry are linear in nature – that is to say thought for the likes of assembly lines in manufacturing – and not commensurate to the complexities of many modern "production" systems with human operators in the loop.

These new theories are being conceived exactly for complex and tightly coupled – a more sophisticated word for "fast" – production systems. Aircraft ground handling certainly is complex and certainly is under time constraints.

In simple terms, aircraft ground handling should be thought of as a system.

Only with this approach will the safety of ground handling be managed upon proper system analysis, design and redesign instead of by analyzing operational risks in an overly simplistic fashion and doing little bits of work here and there.

A systemic approach to safety is about focusing on what Dekker calls "the web of dynamic, evolving relationships and transactions within complex systems instead of looking at single components in an isolated fashion or at some critical component interactions."

ACOSM

But how do you use this theoretical approach – and the related safety management tools – in ways that are practical and actually lead to an improved system of aircraft turnarounds?

Luckily enough attempts have already been made at modeling ground handling as a system, albeit as part of a wider effort at modeling the air carrier operations system.

Representatives from the Federal Aviation Administration and U.S. air carriers met several times during 1999-2000 to develop a system engineering model of the generic functions of air carrier operations.

From these meetings, the team developed the Air Carrier Operations System Model (ACOSM), Version 1.0, an FAA document dated 2001 that is downloadable from the Internet.

The ACOSM model structure uses the Integrated Definition Function Model (IDEF0) format which, with its structured language and tool, enhances and clarifies the analysis of critical system interactions and potential system vulnerabilities.

The ACOSM program was meant to be continued by addressing areas that the ACOSM development team identified as

Researchers attribute aircraft carrier operations' remarkable safety and effectiveness to three traits: self-design and self-replication; authority overlays; and redundancy.

requiring further evaluation and definition in a next version of the document (e.g. marshaling) but was never continued.

A particular section (node A2.3) of ACOSM includes a modeling of ground operations in the IDEF0 format. As reported in the ACOSM document, IDEF0 uses boxes and arrows to describe a process. The boxes represent activities conducted within the organization or system and arrows represent objects or information involved in the activities. The arrows are subdivided into four categories:

- **Inputs:** items consumed by the activity, e.g. the deicing fluid used for aircraft deicing
- **Controls:** documentation that guides, regulates, or influences the activity, e.g. rules, regulations, policies, procedures embedded in operations manuals
- **Outputs:** items produced by the activity, e.g. the aircraft loaded with its payload
- **Mechanisms:** entities used to realize the activity, e.g. ground handling personnel and ground support equipment

In IDEF0 terminology, these are called "ICOMs," an acronym for Input, Control, Output and Mechanism.

ICOMs connect to an activity (function) box from different sides of the box:

- Controls connect at the top.
- Inputs connect at the left.
- Outputs connect at the right.
- Mechanisms connect at the bottom.

Node (activity) A2.3 of the ACOSM model, for example, entitled "Perform ground operations," considers the aircraft turnaround as a system with seven main functions:

- Manage ground operations.
- Perform ground handling.
- Perform cargo handling.
- Replenish consumables.
- Perform line services.
- Perform deicing/anti-icing services.
- Provide ground operations resources.

All these functions have associated inputs, controls, outputs and mechanism.

ACOSM AS MODEL

The ACOSM model of the aircraft ground handling system is eminently descriptive; as such it cannot alone suffice for proper system modeling, but familiarizing with it is perhaps the way at easiest reach for a ground service provider to start modeling its own ground handling activities as a system.

After the initial familiarization, the only way to go forward is that ground handling safety practitioners familiarize themselves with the new tools for systemic safety management. STAMP (Systems Theoretic Accident Model and Processes) and FRAM (Functional Resonance Analysis Method) are the most popular models and a wealth of literature is available for the ground handling safety practitioner to on these tools. It is beyond the scope

of this article to illustrate in detail how these models and tools should be used for a proper system analysis of aircraft ground handling. However, the safety practitioner may refer to Leveson's book "Engineering a Safer World" and Hollnagel's book "FRAM: The Functional Resonance Analysis Method."

AIRCRAFT CARRIERS

If we wanted to speculate as to where a systemic analysis may eventually lead to in terms of mechanisms for safety performance improvement, there is a peculiar type of extremely complex and tightly coupled operation that can be looked at where safety and effectiveness are both outstanding: aircraft carrier operations at sea.

It is very revealing that such a model of high performance includes to a significant extent aircraft handling (although of a different type), because it facilitates the learning of lessons on resilient system performance for those involved in the safety of aircraft ground handling.

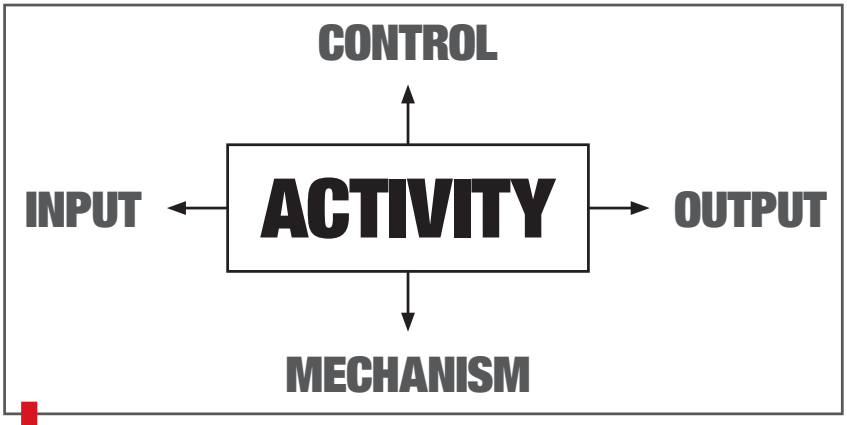


FIGURE 1. IDEF0 MODEL VIEW

The Integrated Definition Function Model uses boxes and arrows to describe a process. The boxes represent activities conducted within the organization or system and arrows represent objects or information involved in the activities.

One of the analogies we can draw between aircraft ground handling at civil airports and aircraft carrier operations at sea is that they are both characterized by very high personnel turnover.

"Continual rotation creates the potential for confusion and uncertainty, even in relatively standardized military organizations," reads a 1987 article from the Naval War College Review by researchers at the University of California, Berkeley. "And yet the Navy demonstrably performs very well with a young and largely inexperienced crew, with a 'management' staff of officers that turns over half its

complement each year, and in a working environment that must rebuild itself from scratch approximately every 18 months."

The researchers attribute aircraft carrier operations' remarkable safety and effectiveness to three traits:

1. Self-design and self-replication

With regard to self-design and self-replication, the researchers note how "operations manuals are full of details of specific tasks at the micro level but rarely discuss integration into the whole. There are other written rules and procedures, from training manuals through standard operating procedures (SOPs), which describe and standardize the process of integration. None of them explain how to make the whole system operate smoothly, let alone at the level of performance that we have observed. It is in the real-world environment of workups and deployment, through the continual training and retraining of officers and crew, that the information needed for safe and efficient operation is developed, transmitted, and maintained. Without that continuity, and without sufficient operational time at sea, both effectiveness and safety would suffer."

As to how operational factors are maintained and transmitted in the face of rapid turnover, the researchers refer the role of the pool of chief petty officers, many of whom have long service in their specialty and circulate around similar ships in the fleet.

Making a parallel with aircraft ground handling it can be inferred that the role of middle managers and shift supervisors as well as their retention should be emphasized for purposes of bringing to the rotating workforce their shared experience. This way leads to an uninterrupted process of on-the-job training and retraining that contribute to make a ground crew an integrated team, where any new recruit can quickly learn and become part of the team.

2. Authority overlays

With regard to authority overlays, the researchers note the adaptability and flexibility of what is a hierarchically structured military organization in the day-to-day performance of its tasks.

Operations and planning are usually conducted as if the organization were relatively "flat" and collegial. This contributes greatly to the ability to seek the proper, immediate balance between the drive for safety and reliability and that for effectiveness .

"Even the lowest rating on the deck has not only the authority but the obligation to suspend flight operations immediately, under the proper circumstances, without first clearing it with superiors," report the researchers. "Although his judgment may later be reviewed or even criticized, he will not be penalized for being wrong and will often be publicly congratulated if he is right."

It seems advisable in the aircraft ground handling environment to promote cooperative behavior, "which tends to minimize the negative effects of jealousy and direct competition" in ways that, however, are not disrespectful of rank and hierarchy – in fact these are "the lubricant that makes the informal processes work."

3. Redundancy

With regard to redundancy, the researchers report two particular aspects:

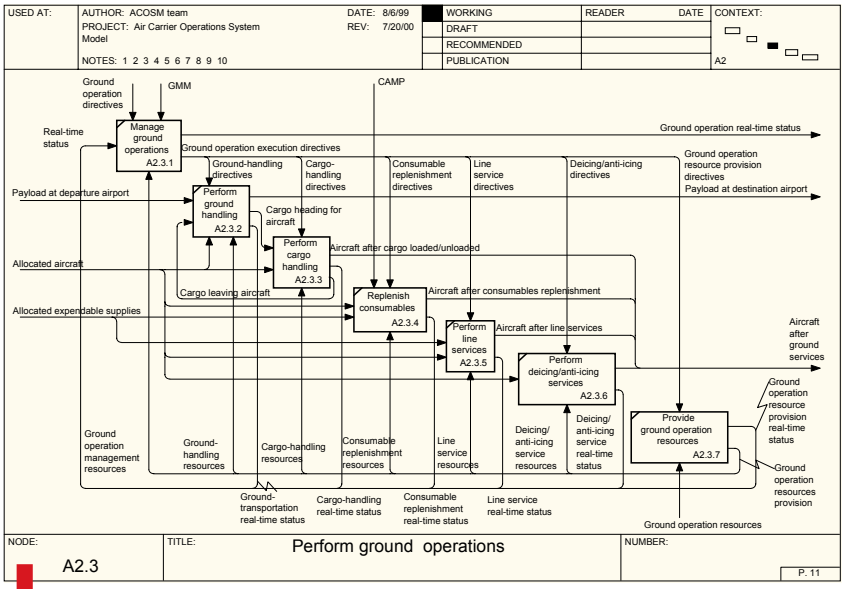
- Internal cross-checks on decisions.
- Fail-safe redundancy in case one management unit should fail or be put out of operation.

As to internal cross-checks on decisions, the researchers report that "seasoned personnel do not 'listen' so much as monitor for deviations, reacting almost instantaneously to anything that does not fit their expectations of the correct routine. This constant flow of information about each safety-critical activity, monitored by many different listeners on several different communications nets, is designed specifically to assure that any critical element that is out of place will be discovered or noticed by someone before it causes problems."

The researchers report as an example a peculiar type of aircraft "handling:" The setting the arresting gear.

"This requires that each incoming aircraft be identified (as to speed and weight), and each of four independent arresting-gear engines be set correctly.

At any given time, as many as a dozen



Graphical rendering of the system of ground operations in the Integrated Definition Function Model format.

people in different parts of the ship may be monitoring the net."

Because of the built-in redundancies and the personnel's cross-familiarity with each other's jobs, the researchers note that based on a history of about a million individual settings there had not been a single recorded instance of a reportable error in setting that resulted in the loss of an aircraft.

"Stressing the survivor" and mobilizing organizational "reserves" are efficient fail-safe redundancy mechanisms that are present in naval carrier operations as identified by the researchers.

"Stressing-the-survivor strategies require that each of the units normally operate below capacity so that if one fails or is unavailable, its tasks can be shifted to others without severely overloading them. Redundancy on the bridge is a good example," report the researchers. "Mobilizing reserves entails the creation of a 'shadow' unit able to pick up the task if necessary. It is relatively efficient in terms of both space and personnel but places higher demands on the training and capability of individuals. What the Navy effects, through the combination of generalist officers, high job mobility, constant negotiation, and perpetual training, is a mix that leans heavily on reserve mobilization with some elements of survivor stressing. Most of the officers and a fair proportion of senior enlisted men are familiar with several tasks other than the ones they normally perform and could execute them in an emergency."

Limiting our systemic safety focus to the positive peculiarities of aircraft handling on naval carriers is revealing.

Learning from such a high-tempo system with an excellent safety performance and interesting similarities with the aircraft ground handling business as well as thinking of safety in a systemic fashion is going to provide change management insights that are far more beneficial to improve our system of aircraft turnarounds.

About the author:

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

People traveled from 21 countries including 43 states within the US to attend the GSE Expo Worldwide.

Returns To Its Roots

More than 1,200 people and 89 exhibitors took part in the GSE Expo Worldwide, traveling to Las Vegas from 21 countries including 43 states within the US.

By Steve Smith

More than 1,200 people and 89 exhibitors took part in the GSE Expo W orldwide, March 10-11, at The Sands Convention Center, Las Vegas. The attendance figures bear out our "Worldwide" coverage of GSE with attendees coming from 21 countries to see the show.

This year' s show was a retur n to what many readers of *Ground Suppor t Worldwide* may remember back when the magazine was still called *GSE T oday*. Gone from the show was the air - craft maintenance sector and its Skills Competition. Instead, we renewed the show's emphasis on ground suppor t equipment.

An attendee sur vey conducted after the show revealed the following:

- More than 77 percent considered the show to a "value-add" to their business.
- Some 8 out of 10 attendees are likely to come back to next year's show.
- While details for next year's show are continuing, Las Vegas remains the most popular destination.

As for the exhibitors, a separate sur - vey showed the following:

- More than 67 percent said the show either "exceeded" or "met" their expectations.

Some comments from the surveys included:

"Quality of the show greatly improved,"

"... a pleasant surprise,"

"... better than in past years,"

"a step in the right direction."

- Some 2 out of 10 exhibitors were first-time exhibitors.
- The majority of exhibitors rated the quality of their show leads highly.

Exhibitors and attendees were provided with several networking events on the show floor where they enjoyed coffee in the morning, lunch in the afternoon, and cocktails and music at the Opening Night Reception.

One of the show highlights was our Ground Support Leader of the Year Awards, which has been a part of the show for many years. During our Opening Night Reception, we honored the following:

- **Gerald (Jerry) Eberle** was awarded the Lifetime Achievement Award, which goes "to the person who has demonstrated commitment to the industry through numerous years of dedicated service."

Eberle invented, engineered, manufactured and marketed products through PAGE Industries, which he founded in 1976, or through an outside marketing firm. Many of these product advancements are now considered common place, such as the baggage chute, slot filled designed PCA adapters and 180 kVA reactive load banks – the most used gate park systems in the world. (We'll be doing a cover story on Jerry in our May/June issue.)

Gerald Eberle earned our Lifetime Achievement Award.

More than 1,200 people and 89 exhibitors took part in the GSE Expo Worldwide.

WASP won our Product Leader Award for its New Standard Dolly.

LEKTRO celebrated 70 years of business with LEKTRO-red frosted cupcakes.

- **WASP Inc**. was named Product Leader of the Year for its "New Standard Dolly." (For more on WASP and its product, turn to page 8.)

Matt Sheehan accepts his Team Leader Award.

- **Matthew Sheehan**, AERO Specialties, was named Team Leader of the Year, an award that honors an "individual who has taken a leadership role with personnel."

Sheehan started AERO Specialties in 1987 from his attic with just $1,000. The company currently operates with 50 employees and 30,000-plus sq. ft. of manufacturing space selling to more than 16,000 customers. (Look for our cover story on Matt in next month's issue.)

During the award festivities, the magazine also congratulated LEKTRO on celebrating 70 years this year. LEKTRO was founded in 1945 and has been located in Oregon the entire time, with Eric Paulson as president and a second-generation owner of this family business. LEKTRO built their first electric towbarless aircraft tug in 1967 which they named the AirPorter. LEKTRO's tugs have always been and still are today all electric and can tow an aircraft ranging from piston engine to narrow-body airliners.

The magazine started the Leaders awards in 2005 as actually one award; *Ground Support Leader of the Year*. The award was created to spotlight an individual or company that had made a significant contribution to the industry.

Our first winner was Jim Houck with Continental Airlines.

For more information on next year's event follow us on Twitter @GSEexpo2015 or go to our show's website: gseexpo.com

Do We Really Learn?

Airports are inherently hazardous environments. The reason most people can go home at the end of each day is because the hazards are generally managed so that people don't get hurt.

By Ian Bell

About 4 years ago, I embarked on a project of repairing a Permit to Work system because it was clearly broken.

I had been arguing the case for some time within the specific line of business I was working, but was not getting heard. When I moved into a central safety role, again, I started speaking out to generate interest in repairing the system after reviewing incidents and found two almost identical at the same location in almost identical circumstances.

In both incidents, contractors touched live electrical cables while excavating. Neither were significantly injured, but both received a "jolt." In the first incident, the power was supposed to have been turned off and the cables de-energized. In the second, a contractor was digging just 12 inches from where the cables were supposed to be laying.

Then last week, I received a call from a friend who had just investigated an incident at a retail fuel site where there had been an incident. He shut the site down and investigated the causes. He was still doing this when pressure to get people back to work resulted in the site having another absolutely identical incident. In neither incident was anyone hurt, but they could have been killed in both incidents.

Airports are inherently hazardous environments. The reason most people can go home at the end of each day is because the hazards are generally managed so that people don't get hurt. *But* it is very rare when an incident occurs that we have never seen before.

As a result, we end up unnecessarily hurting another individual and family because the industry had the knowledge to prevent the incident, but failed to adequately control it. So I ask myself why we cannot effectively share information so that we all benefit from one misfortune and have an opportunity to refine our processes and procedures to prevent an incident from happening again.

We have the knowledge as an industry; but individually or organizationally, we may not. Why?

Information sharing in the right form and environment is vital, but the lawyers get panicky about this. They have a real and proven fear of litigation. Providing information on the causes of an incident may lead to legal action. Or someone may misinterpret the information and apply a process incorrectly so we do not share. Holistically, this results in us accepting that people will be injured – just not our people! But even that is not correct as you can see by the incident I talked about at the beginning of this article where in the same organization and even the same line of business we had the potential to hurt people because they did not understand the risks and control them adequately.

'JUST CULTURE'

Consider the following:

- **Incidents and near misses must be reported so they can be recorded without fear of retribution.** Where people are fearful of reporting, people get unnecessarily hurt. There still has to be consequences for some actions, but this needs to be viewed within the 'Just Culture' model so that an honest mistake or a lapse is not treated the same as a willing and negligent act.
- **Causes must be understood,** which means that all incidents and those near missed with significant potential consequences must be investigated to determine the root cause and the contributing factors.
- **People must be engaged.** The incident learnings and causes must be communicated widely throughout the organization in a way that makes sense to people, in a way they can relate to, in language they understand and can

Causes must be understood, which means that all incidents and those near missed with significant potential consequences must be investigated to determine the root cause and the contributing factors.

discuss with their workmates. Managers need to facilitate the discussions within the work groups to see how this type of incident could occur in their part of the business with their activities or similar (it is this "or similar" activity or situation that is often missed in the discussion). Managers should facilitate discussion not preach. The group generally know more about the activities and the relationship between the incident being discussed and their work activities than the manager will and can relate the information to their circumstances if it is explained well.

- **Processes must be reviewed to determine whether the same or similar consequences can occur in similar or different circumstances.** You need to think broadly and engage the experts in the activities to test and challenge the assumptions to know what and how the established processes can fail so you have the opportunity to identify the hazard if it has not been considered previously in the controls and procedures, to check that the controls will work when called upon and that people understand the controls to be able to apply them correctly.
- **People must be instructed and tested and supervised** to ensure their understanding of modified processes so they can apply them correctly.

Let's take a near miss as an example where a worker at Airport A was nearly crushed when reaching under a belt loader to retrieve a bag that no one else saw while his mate was lowering the belt preparing to move it away from the aircraft. The investigation will determine the following causes:

- **Root Cause:** The bag was placed inappropriately on the belt.
- **Contributing Factors:** Worker did not recognize the hazard. No training on how to recover bags in this area. Time pressure to turn the aircraft around. No communication to co-worker that the worker was going to get the bag, etc.

The fact-finding process should not overly focus on the detailed specifics of the incident other than to provide a brief overview. The facilitator should focus the group discussion on the risk and where in their workplace with their activities and those of others that the risk could happen and then ask what controls are in place to prevent these. accidents After that, there will generally be procedures that need to change and people to be trained in the altered procedures.

Remember, the best control is to eliminate the hazards or work down the hierarchy of controls to find the strongest controls you can to prevent the incident from occurring.

When you have found gaps in procedures, training or behaviors and corrected them, tell other companies on the airport through the Airport Safety Committees and ask the safety representatives or managers to tell other locations because effective and timely communication is the key to stopping others getting hurt…even if the lawyers find it hard to bare their souls!

Aviation regulators have a real role in this process and I hope will take this need on board to create an effective communication conduit to incident learnings even for ground staff.

About the author:

Ian Bell, director of Global Safety Partners, has a long history in the aviation industry first with Trans Australian Airlines and Australian Airlines (the forerunners to Qantas). He spent 11 years in airlines' operational roles before joining the Shell Company of Australia where he spent 23 years in a range of senior management roles including having primary operational responsibility for the Shell Aviation operations throughout Australia and Papua New Guinea. Ian has also been involved with the Australian Aviation Ground Safety Council, which is intently focused on improving ground safety performance in airports across the Australasian region. He can be contacted at globalsafetypartners@gmail.com

Are You Measuring Quality Of Service?

Without an established measurement, "quality of service" is in the eyes of the beholder.

By Will Ryder

Competent GSE maintenance managers are proficient at work shift scheduling, providing technician coverage, dealing with workload and managing shop work flow. Shop managers typically establish solid performance metrics and key performance indicators (KPIs) to measure areas such as productivity and returns or to track equipment status.

However, frequently shop managers fail to measure "quality of service."

When I talk "quality of service" with colleagues in the airline and transportation industry, they usually have a definition based on their own perspectives. "We give great service" is a mantra easily delivered by most maintenance managers. But they are often stumped when asked: "How do you measure quality of service?" or "How do your customers define quality service?"

EXPECTATIONS

Without an established measurement, "quality of service" is in the eyes of the beholder. Customers have expectations for their service experience. They then compare their actual experience with their expectations. The result "establishes" their perception of the service actually being offered. (As an example, we can have a "very good" service experience at a fast food restaurant where we wait on ourselves and bus our own tables. We can have a "pretty poor" service experience at a sit-down restaurant where we are waited upon and someone else cleans up after us. Expectations impact our perception of quality of service.)

One example of a quality of service measure in our industry is Equipment Repair Turnaround Time (TAT). Many airlines and aviation industry service providers track TAT. Typically, TAT is a measure of the time between when an asset is taken out of service for a PM or repair and when it is returned to service. Most of us have been in a situation where we've received a report, generated at corporate headquarters, that says we're less than successful in providing service. The report shows the service "benchmark" established in hours or days. Then, it shows our performance at days or weeks, far short of great service. But, we know we turn a PM and most repairs in just a few hours.

MEASUREMENTS

At our company, we touch nearly 14,000 assets each month. From the time an asset hits our shop door to the time we return that asset to the ramp, we rarely have a piece of equipment in our shop for days or weeks. So how could there be a perception that our service is lacking? The answer depends both on how the TAT is measured and by whom.

Measuring turnaround time can include many variables. As a service provider, we need to understand how each customer measures TAT. Is it measured from when the asset comes out of service to when it is returned to service (a physical assessment)? Or is it measured from when the work order is generated to when the work order is closed (a computer-based assessment)?

Recently, a major airline initiated a measurement of TAT that started when a work order was created. The asset, whether in service or not, was considered out-of-service and was on the clock when the work order was created. If a service provider created a work order for a PM that included deferred maintenance repairs that were to be done in the next month, that repair was on the clock. The first Equipment Repair Turnaround Time Assessment following that new approach made a service provider's TAT look very poor. In the eyes of the customer, the service provider's quality of service had gone down significantly.

Shop managers must understand how each customer defines quality of service. Turnaround time is just one measure of quality of service. They should also define and establish qualitative measurements for quality of service, which are as important as KPIs for productivity and returns.

About the author:

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

The I-Team

LaGuardia Airport and the FAA recently tested infrared bird detection technology that shows promise not just to prevent bird strikes, but also to detect FOD.

By Ronnie Garrett

In September , the F AA repor ted three bird strikes in a four -hour period at New Y ork's LaGuardia Air - port. No one was injured, but the potential for tragedy exists anytime there's a bird vs. airplane incident.

Though bird strikes occur infre - quently—the F AA repor ts just 30 per day out of 50,000 civilian aircraft movements—they can cause a plane to crash. The most notable incident of this type, known as the "Miracle on the Hudson," occurred when US Air ways Flight 1549 made an unpowered emergency landing in the Hudson River after multiple bird strikes caused both jet engines to fail. Though all 155 people on-board sur vived due to the heroic actions of Capt. Ches - ley B. "Sully" Sullenberger , the incident left a lasting impression on what can happen when bird strikes occur.

Six years after this crash, LaGuardia Airport and the F AA partnered to trial a new automated infrared bird detection system from Pharovision. The system is designed to help prevent collisions be - tween aircraft and birds in air . Dr. Nich- olas Carter, finance director of the World Birdstrike Association, explains that while airports currently do many things to prevent aircraft from encountering birds on or next to the runway, little is done once the plane leaves the ground.

"While air traffic controllers cannot control bird movements, with timely information in hand, they can mitigate the possibility of a serious bird strike by altering the timing or flight path of an aircraft," he says. "If, for example, controllers (and thereby the pilots) had been aware of the flight path of the flock of Canada geese traversing the airspace outside of LaGuardia, Flight 1549' s de - parture could have been delayed by 30 seconds or the climb-out altitude could have been altered in order to avoid crossing paths with the birds."

Researchers located the Interceptor on the roof of one of LaGuardia's central concourses.

Port's Pilot Program

"The F AA conducts a great deal of re - search concerning wildlife hazards with aircraft," says Marcia Alexander -Ad- ams, spokesperson for the F AA Office of Communications. "This includes in - vestigating many new technologies for mitigating wildlife as well as systems that can better monitor and detect their movements."

After observing a brief demonstration Pharovision's Interceptor outside the air- port environment, F AA officials agreed the next logical step was to demonstrate the system in an airpor t environment. They then par tnered with the Por t Au- thority of New Y ork and New Jersey to install the system at LaGuardia from October 2014 to Febr uary 2015. The In - terceptor fits the FAA's requirements. According to Laura Francoeur , chief wildlife biologist for the Por t Authority of New York and New Jersey , the goals of the demonstration were to test the system as a possible alter native to bird radar at a major metropolitan airport.

For the trial, researchers installed a single Interceptor system looking out over the Bronx and the East River/ Eastchester Bay, the area where Flight 1549 encountered the flock of geese. Re- searchers located the system on the roof of one of LaGuardia' s central concours - es, near the end of the concourse closest to active runways.

According to Carter, this site was cho- sen for a number of reasons:

- Ease of access.
- The infrastructure already in place to support the system.
- A nearby ramp control tower where personnel could operate the system while still seeing the whole airfield and surrounding environment (to verify detected targets, etc).
- A (mostly) unobstructed view of the bay and the majority of the airfield.

Within the first four hours after deployment, Carter states airport personnel discovered two significant and serious bird strike hazards that had gone unnoticed. The system detected a number of large cormorants flying in the late afternoon through the approach to Runway 04/22 to roost for the night on the pier supporting the approach lights for Runway 13/31. More than 100 of the sizable birds were spending the entire night, perched just meters below the oncoming aircraft landing on Runway 13. Even airport personnel dispatched to the beginning of the pier equipped with binoculars were unable to observe the roosting birds from their position roughly 1 kilometer away, despite the fact that the birds were clearly visible with Interceptor, located an additional 2 kilometers further from the roost site. Additionally, Carter reports the system detected a second substantial roost of gulls, located on the lighting pier of the departure end of Runway 04, roughly one kilometer from the runway overrun and actually several kilometers closer than the site of the bird strike by Flight 1549. Again, airport personnel deployed to the end of the runway were unable to see the birds at all, despite the fact that dozens of large gulls were perched directly below the flight path of all aircraft utilizing that runway.

Francoeur states the system is "another potential tool to improve the efficiency of a wildlife management program at the airport" but adds further study is warranted.

Alexander-Adams adds a comprehensive analysis of the results by the FAA will take a year or more.

"We were able to detect some bird activity over the George Washington Bridge, but detection varied greatly, depending on bird size, distance from the airport and other environmental factors," she says. "The system also detected some rat activity near the perimeter fence bordering Flushing Bay in the evening and we have responded to that with changes in our rodent management program."

Automated Detection

The Israeli Ministry of Defense originally developed Pharovision's automated infrared system, known as "Interceptor," for detecting rockets and small gliders being launched over the borders of Israel by terrorist organizations and other enemies. Developers later modified the system to automatically detect birds utilizing airspace around an airport, as well as birds and other wildlife (like deer, foxes, etc.) on the airfield itself. The system warns air traffic controllers (ATC) of the threat, who can then modify flight paths or delay aircraft departures briefly to prevent the flight paths of aircraft and birds from intersecting.

The Interceptor had a mostly unobstructed view of the bay from its perch during its trial at LaGuardia Airport.

The Interceptor, which runs $200,000 to $600,000 depending on the modular components an airport requests, consists of several components, though the sensor unit itself is small enough to fit on a tripod on the top of an airfield antenna. The sensor unit transmits data back to a computer array, which displays panoramic and high resolution images, an aerial map overlay, and all detected targets on a number of monitors, along with relevant data on the targets such as azimuth, elevation, size and range.

The system uses an infrared and electro-optical scanning payload and advanced proprietary image-processing algorithms to automatically detect individual birds and flocks of birds, day or night. It is also capable of manual user control, allowing users to observe further, track targets and study specific targets on a real-time basis. The Interceptor system produces visual imagery, which enables users to positively identify detected targets and determine the altitude, behavior, individual numbers or group size, and contextual placement within the actual environment. In addition, the basic system is completely passive, causing no electromagnetic interference with other systems. It can be controlled from a remote station, far from the payload, using an Ethernet link, or link through fiber optic cable or radio frequency signal.

"Air traffic controllers are too preoccupied to be staring at a screen waiting to see birds enter their field of view," states Carter, who emphasizes a bird detection system must be automated.

The Interceptor system is capable of warning air traffic controllers when pre-defined levels of birds or wildlife are in close proximity to an area that could impinge on aircraft flight corridors. "Other systems require user interaction to scan and detect targets," he says.

Pharovision displays all detections as true visual images of the targets themselves. An operator can easily assess the types, numbers and locations (especially altitude) of detected targets without extensive training or understanding of a complex representative system. "Unlike radar output, Interceptor's images are simply enhanced visuals and are not electronic signal returns translated onto a flat, two-dimensional model of the airport environment," Carter says. "An observer can actually see the individual birds present in the context of the

surrounding environment and can view target behavior." When scanning in automated detection mode, the system follows a series of predefined scan regions, looking for variability in thermal or optical images. The system can be used with either the infrared camera or the electro-optical video camera conducting the detections. Currently it is not capable of scanning and performing detections with the FLIR and CCD cameras simultaneously, though the detection cameras can be switched with the simple push of a button. As the automated scan proceeds, the system highlights detected birds with a green (or user-defined color) box on the panoramic display. Each target is delineated with its own highlight box and as the scan proceeds, the system updates the visual highlights to show the latest three scans on the panoramic display, removing highlighted boxes where birds are no longer detected. This allows a viewer to see the movement of a bird within the environment, at the same time not creating an overload of warnings with historical detections. Audible warnings or advisories can be associated with target detections or, as the system is currently configured, associated with a critical mass of target detections defined by the user.

"While air traffic controllers cannot control bird movements, with timely information in hand, they can mitigate the possibility of a serious bird strike by altering the timing or flight path of an aircraft."

Nick Carter, finance director, World Birdstrike Association

Though not implemented at this time, users can set a bird threat level, or "Bird Watch Condition," to correlate with variable levels of bird detections. Once a pre-defined threshold of birds is reached, a visual and/or auditory warning could be announced, associated with Bird Watch Condition "Moderate" and "Severe" (or "Yellow" and "Red"). Users could modify these levels as conditions warrant or throughout changes in yearly migratory patterns. They could also change them daily or hourly, with differing threat level advisories based on variable bird movements. The Interceptor records its output, which can be replayed at any time, to allow officials to review the incident later. Depending on the size of the hard drive incorporated, the system allows for continuous and uninterrupted recording for weeks or even months at a time. Users can extract video clips or still images in any number of ways. "There are immense benefits of employing recorded video clips in lieu of written reports to demonstrate the actual hazards present in the environment in order to request specific actions be taken to mitigate identified risks," says Carter.

Future Focuses

Ultimately, a significant challenge facing deployment of this type of system is its integration into the daily operations of air traffic controllers. Carter explains, "Currently, no concept of operations (CONOPS) exists for incorporating wildlife detection systems in air traffic operations." Alexander-Adams reports the FAA plans to develop an Advisory Circular to assist those airports interested in employing an automated infrared system to best determine the minimal requirements of such a system. She adds that the FAA will also, in the near future, evaluate the precise capabilities of the system in a more controlled environment with known targets of specific sizes and distances. "Something not possible in the real-world environment of the busy LaGuardia airport and surroundings," Carter states. Pharovision is also working to enhance the capabilities of the Interceptor as well as improve the user interface and operator interaction, and refine the secondary usages such as foreign object debris (FOD) detection. "The system will be (in the next month or so) tested to verify conformance with the FOD detection requirements under the FAA's existing A/C on FOD systems," states Carter. "The Israeli Air Force is implementing 25 to 35 of the systems at all of its major airbases for usage as FOD detection systems, with the added benefit of conducting wildlife detection (though FOD detection will be the principle function)."

Interceptor's Other Uses

Though designed to prevent bird vs. aircraft incidents, Pharovision's Interceptor also offers other solutions for today's busy airports, states Dr. Nicholas Carter, finance director of the World Birdstrike Association.

FOD detection. The system can be utilized as an automated foreign object debris (FOD) detection system, capable of detecting any object on a runway or taxiway surface from more than 800 meters away. Though one unit is not sufficient to cover a typical runway, several units in combination can be employed to automatically scan the tarmac as well as any adjoining taxiways and other surfaces.

Security. The Interceptor can be used as a security system, capable of scanning the entirety of a perimeter fence and notifying the user of any potential intruders. Because it operates in the infrared and does not rely on pressure/touch sensors, it can serve as a "virtual fence," functioning in areas where no fence exists. If, for example, flight operations at a particular airport cease at 11 pm, the system can be placed in a security scan mode to detect potential intruders along the airfield perimeter fence line then returned to bird detection the following day when flight operations resume.

Enhanced Airfield View. The system enables air traffic controllers to see everything on the airfield, basically turning the dark of night into day. The enhanced visuals provided by the system allows them to view situations such as wingtip clearances, vehicular traffic, aircraft on the ground and in departure/arrival corridors, and even personnel moving about on the ramp.

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.

AviationPros.com/company/10026912

Fall Restraint System

ThyssenKrupp Airport Systems

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

AviationPros.com/company/10026706

9900 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.

AviationPros.com/company/10441040

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.

AviationPros.com/company/11191740

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 light. Backup alarm. Horns. Safety corner bumpers. Chocks along with other safety items. Towbar covers. Safety vests. Day and night wands. Relays, gauges and ignition switches.

AviationPros.com/company/11355218

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.

AviationPros.com/company/10720554

PRODUCT HANGAR

AvRamp

I.D. Systems Inc.

Managing a fleet of aircraft ground support, operations and handling vehicles in an airport creates many significant, proven benefits. I.D. Systems' patented vehicle management system, AvRamp™, helps you increase productivity, establish total visibility and accountability of vehicles and operators through vehicle access control, improved safety and security, and reduced maintenance and operating costs.

AviationPros.com/company/10184914

Protective Bumpers

Carson Mfg.

Protect aircraft from accidental damage by relying on Carson Mfg. Safety Bumpers for all GSE. Carson Safety Bumpers are specifically designed to attach to airline baggage carts, service equipment and service docks to protect aircraft and equipment from accidental scratching or denting which can lead to breaches in the aircraft fuselage. Personnel are also protected from injury from overhead obstructions and sharp edges.

AviationPros.com/company/10810920

Wireless Ground Support

Flightcom Corporation

Flightcom supports hundreds of thousands of commercial and military flight crews and ground support personnel with communication systems that deliver clear communication, even under the most challenging circumstances. Its wireless ground support systems keep aviation and ground crews safe, effective and productive during aircraft ground pushback, marshaling, maintenance, and deicing operations.

AviationPros.com/company/10441101

Evaporative Cooling Vests

Silver Eagle Outfitters Cooling Apparel

Silver Eagle Outfitters is the leading manufacturer of comfort apparel that emphasizes temperature regulation and sun protection. Available in high-visibility fabrics, Silver Eagle's cooling vests offer hours of evaporative cooling and immeasurable quality of design and fabric. The microfiber apparel provides year-round, temperature-mitigating comfort and UV protection, and is ideal for wearing alone or beneath other garments.

AviationPros.com/company/10442976

Mobile Workforce Solution

SITA

SITA
Create success. Together

Mobile Workforce Solution is a single, end-to-end solution which enables the integration of airline and airport back-end systems, such as passenger processing, airport resource, management, baggage handling, cabin crew and DCS with mobile connectivity devices and support and management.

AviationPros.com/company/10177310

Mobile Spill Station

Andax Industries LLC

Take spill-response to the source. The Mobile Spill Station will contain up to a 50-gallon spill. Includes 150 sorbent pads, six Sorb-Sox, 16 pillows, four pairs of gloves, four goggles and two rolls of barrier tape.

AviationPros.com/company/10810906

Access Control

CyberLock Inc.

The CyberLock system of electronic locks and programmable keys are ideal for airport facilities looking to increase security and control access to hangers, gates, server rooms, and restricted areas. Each key is programmed with specific access schedules based on time, date, and authority level—so only authorized users can access restricted areas.

AviationPros.com/company/11104412

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.

AviationPros.com/company/10810861

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

Cloud-based GSE Monitoring

Access Control Group

AssetPro is a cloud hosted solution to monitor GSE fleets across your airport network. It monitors ramp agents, usage, abuse, location, fuel and provides alerts if exceptions occur. It runs on a Windows-embedded platform.

AviationPros.com/company/12012924

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

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.

AviationPros.com/company/11104693

Safety Markers

Plasticade

Plasticade manufactures a variety of safety cones, markers, and channelizers with or without retroreflective sheeting that are perfect for ground support applications.

AviationPros.com/company/12012967

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.

AviationPros.com/company/10925012

Pushback Headset

Comprehensive Technical Solutions

CTS' M2 is a high quality, classically styled pushback headset with a budget friendly price. CTS can supply quality push-back communications equipment including headsets, heavy-duty extension and splitter cables.

AviationPros.com/company/11191856

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.

AviationPros.com/company/10810973

Runway Safety
Aviation Tutorials Company Llc

Can your crews afford a runway incursion? Do they know how to conduct safe aircraft ops on the airport surface? Getting Around On The Ground can help, an interactive training course on runway safety and accident prevention. This online course provides more than three hours of narrated, interactive training and gives database-tracked results. Includes a 3-D taxi simulator with 40 scenarios. Perfect for pilot and maintenance initial and recurrent training.

AviationPros.com/company/11323838

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 (marshaling agent, wing men, tug driver, pilot); optional connection to trunking radio communication.

AviationPros.com/company/10026945

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.

AviationPros.com/company/10441324

NoiseBuster Active Noise Reduction Safety Earmuffs
Pro Tech Technologies Inc.

If you work around aircraft engines and other aviation equipment including blowers, motors, vacuums, generators, compressors or fans, you need protection against the low-frequency noise – noise that conventional passive earmuffs alone can't handle. Only NoiseBuster Active Noise Reduction safety earmuff combines a high-performance passive earmuff with advanced Active Noise Reduction technology for the most comprehensive hearing protection available to industry today.

You have choice of configurations: PA4000 Over-the-Head, PA4100 Behind-the-Head, PA4200 Hard Hat/Cap Mount.

Add the communications module for two-way communications and get improved intelligibility in high-noise environments. Cell phones and smart phones, as well as hundreds of two-way radios, supported.

AviationPros.com/company/10927583

Clear Communications
Telephonics

The TruLink® Wireless Intercommunication System delivers clear communications through full duplex, hands-free technology. The lightweight and rugged units operate reliably in high noise environments, providing flawless communications coverage.

AviationPros.com/company/12017453

PRODUCT HANGAR

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

Safety Wand HD

Safety Wand Corporation

Safety Wand HD in Orange, Yellow. On/Off or On/Off/ Flashing. When you need the best.

AviationPros.com/company/10976805

Steve Smith

Airlines $18 Billion Richer For Not Losing My Luggage

Well, that's one way to look at the improvements highlighted in the latest SITA Baggage Report.

By Steve Smith

Technology is making mishandled luggage less and less likely, according to the 2015 Baggage Report, an annual study done by aviation IT specialty firm, SITA.

Over the past seven years, for example, airlines and airports have lost 61 percent fewer bags and airlines have saved $18 billion in the process.

The numbers are particularly admirable considering the relentless pace of air travel. Out of every 1,000 passengers, only 7.3 bags were mishandled last year - despite a one-third increase in passenger enplanements from 2007, with 3.3 billion passengers boarding planes last year.

TECHNOLOGY

SITA's CEO Francesco Violante attributes improvements in baggage handling technology and new baggage processing systems for these rising marks.

"The investment the industry has made in baggage systems automation and processes have made a huge difference to the reliability and speed of baggage delivery, in particular for bags transferring from one flight to another," he says.

But in order to stay on top of this performance, the industry must continue to invest in further automation and better baggage tracking technology.

"Given the success already in bringing down the mishandling rate, driving further incremental improvements is going to be that much harder," he says. "We have already seen the additional pressure in 2014 of record load factors and a 5.4 percent uplift in the number of passengers nudge the mishandling rate up to 7.30 bags per thousand passengers, from 6.96 the previous year."

PAX, TOO

But it's not just up to the aviation industry. Many of the improvements depend on passengers doing their part, too. Services like at-home baggage tag printing, self-check luggage bins at airports and luggage tracking apps combine to help airlines and airports handle luggage more efficiently.

"Baggage processing and management ranked among airports' top investment priorities, with investments in self-service processes, such as kiosk and bag-drop technology leading the way," Violante adds.

Over the next three years, the report says that almost six out of 10 airports indicated that they would invest in major self-service programs since many tech-friendly customers want to have some control over their flights and ensure that their bags are waiting for them at the carousel.

Consider that 18 percent of airlines currently offer passengers the ability to report missing bags via self-service kiosks and 10 percent via smart phone apps. But by 2017, nearly two-thirds of airlines expect to offer these services.

PAGE Industries the GSE Leader in **Breakthrough** Technology

PAGE INDUSTRIES
Your CONDUIT to performance

The most revolutionary 400 Hz Cable Assembly to be introduced in the past 20 years with such features as broken neutral detection, thermal protection and the new incredible **HARDNOSE™** Cable Plug.

PAGE Industries has been listening to their customers to determine, design, and introduce what the airline industry wants and needs. PAGE, known as the industry leader in innovation and for bringing new products to market, is introducing this year their completely unique PCAir Connector with a built-in swivel, "high flow" screen and the industry's best and only "snap-in" gasket; a stronger, better and easier to install Baggage Chute; and a new digital 400 Hz Reactive Load Bank capable of testing two 90kVA loads at a 0.8 pf.

Phone: 1-707-469-7243 ▪ **Toll Free**: 1-800-465-PAGE ▪ **FAX**: 1-707-469-7244 ▪ **Web**: www.pageindustries.com
ADDRESS: 2050 Cessna Drive, Vacaville, CA. 95688 ▪ **CONTACT**: sales@pageindustries.com

Go Green

With Ford Advanced Technology Engines.

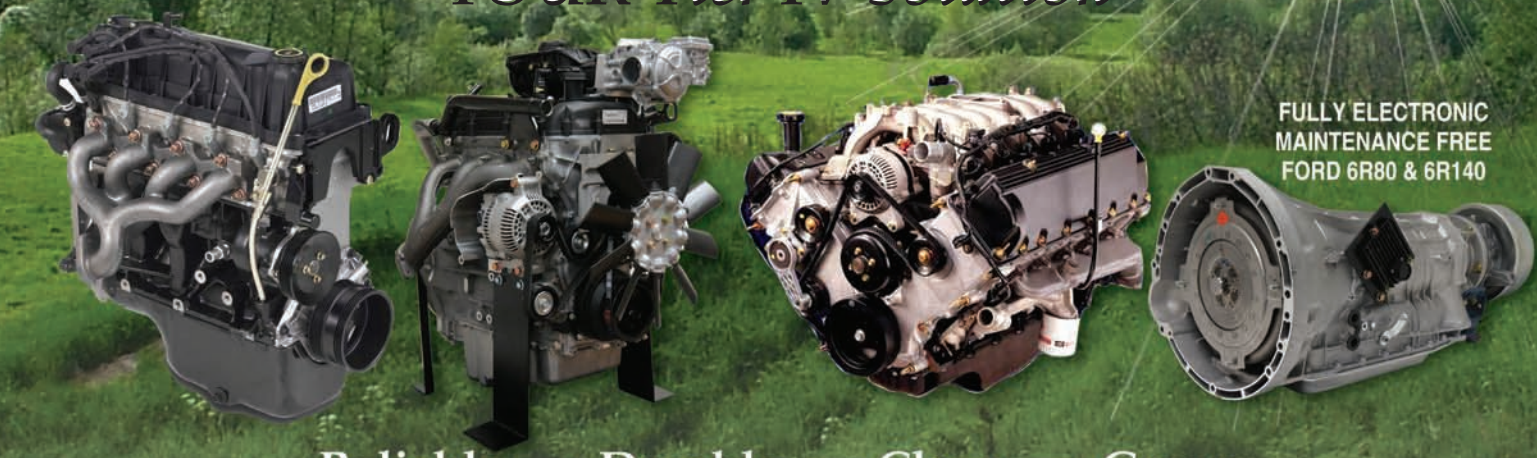
A Green Alternative to Diesel from

ENGINE DISTRIBUTORS INC.

Ford Power Products

Coming Soon! NEW 3.7L Engine

YOUR Tier IV Solution



Reliable — Durable — Clean — Green.

Featuring a complete line of EPA and CARB Certified 1.6, 2.5, and 6.8 L LSI Engines ranging from 20 to 200 hp. Available in Gasoline, LPG, CNG, Natural Gas and Dual Fuel. Our engines are the solution to high priced Tier 4 Diesels. Secured Volumes, Longer Life Cycles, Dry Fuel and Flex Fuel Valve Trains – You Can Find It At EDI. Performance you can count on!

Contact One Of Our Distributors Today!

Our line of LSI industrialized Ford engines are serviced through a Global Dealer Network.

Anderson Industrial Engines Co.
Omaha, NE 402-558-8700

Southwest Products Corp.
Phoenix, AZ 877-779-3581

Diesel Power Equipment
Chicago, IL 877-876-3732
Farmington, MO 800-876-3732

Engine Distributors Inc.
Archdale, NC 800-220-7080
Blackwood, NJ 800-220-2700
Ft Lauderdale, FL 800-257-6605
Holliston, MA 800-220-2700
Jacksonville, FL 800-342-3575

Engines,Inc.
Jonesboro, AR 800-562-8049

Powertech Engines Inc.
Fresno, CA (800) 750-1776
Fullerton, CA (800) 784-1776

Perkins Pacific
Ridgefield, WA 877-877-3311

McDonald Equipment Co.
Willoughby, OH 800-589-9025
Portland, MI 800-445-5273

M. G. Bryan Equipment Co.
Grand Prairie, TX
972-623-4300

D A C Industrial Engines Inc.
Dartmouth, NS, Canada
902-468-3765

Marindustriel
Montréal, QC, Canada
514-342-2748

Oakville, ON, Canada
800-866-3831

Simson Maxwell
Edmonton, AB, Canada
800-374-6766
Calgary, AB, Canada
800-374-6766
Port Coquitlam, BC, Canada
800-374-6766
Nanaimo, BC, Canada
800-374-6766
Prince George, BC, Canada
800-374-6766

All Marine Spares
Mona Vale, N.S.W., Australia
61-2-99972788

Compagnia Tecnica Motori S.p.A.
Milano, Italy
+39 0245058238

Fornaut Ehm Sa
Le Pre St Gervais, France
01133148450394

Power Torque Engineering Ltd
Binley, Coventry, UK
011-44-247-663-5757

Sauer Motive Systems
Sauer and Sohn KG
Dieburg, Germany
011-49-607-120-6330

Engine Distributors Inc. • 400 University Court • Blackwood, NJ 08012
Phone: (856) 228-7298 or (800) 220-2700 • www.edi-dist.com