

airport business

*Delivering New Standards of Performance
to Airport and FBO Management*



CYBER INSECURITY

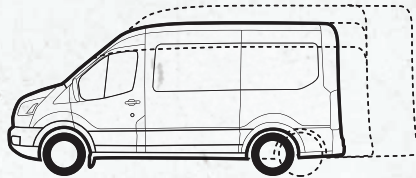
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Attacks against cyber security networks are increasing. Experts warn it's time for airports to boost their digital defenses

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THE MOST VEHICLE CONFIGURATIONS IN ITS CLASS.*



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The Transit van and wagon are available in 2 different wheelbases, 3 different lengths and 3 different heights. That makes it easy to choose one that will fit you and your business exactly. And if that's not enough, it's also available as a chassis cab and cutaway.



THE ALL-NEW
**2015
TRANSIT**

OPEN FOR BUSINESS



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↑↑↑ OVER ↑↑↑
6'5" TALL



With an available cargo ceiling taller than some basketball players, the Transit van has loads of room for boxes, tools and you. That comes in handy if you want a mobile workshop that lets you stand up straight. And the advantages just keep piling up.



• THE NUMBERS DON'T LIE •

*Based on body type, body length, and wheelbase and roof height. Class is Full-Size Vans. **Class is Full-Size Vans. †When properly equipped. ††Class is Full-Size Vans, when properly equipped. Excludes diesel competitive models.



The 2015 Transit can offer a best-in-class gas-powered maximum **CARGO CAPACITY OF 487.3 CUBIC FEET.¹¹**



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INSIDETHEFENCE

Ronnie L. Garrett
Editor



Could Hackers Halt Air Transportation?

On Friday, September 26th, one man and a lighter brought U.S. air travel to its knees.

FBI reports say Brian Howard, an airport telecommunications employee, used his access card to enter the radar facility he worked at in Aurora, Ill. He posted his intentions for ill-doing to Facebook 30 minutes after arriving with a black roller bag in tow. Then he started a fire that crippled air traffic across the nation.

The fire grounded flights at Chicago O'Hare and Chicago Midway airports, and led to approximately 2,100 flight cancellations at major airports across the country. Flight cancellations continued on Saturday and Sunday, with 1,100 and 700 cancellations respectively.

Though as of press time, air traffic is nearly back to normal, it's unsettling to see what one disgruntled employee can do.

This issue of *Airport Business* focuses on security. And while there have been several examples of physical security breaches over the past year, we examined a more hidden threat—cyber attacks.

Every day single individuals and organized cyber crime operations attempt to breach the networks of our nation's airports. While many of these attacks are thwarted at the gates, some are successful.

In June, the federal government stopped a prolonged operation to spy on aviation systems at 75 U.S. airports. But the attack was first discovered in 2013 and it took till mid 2014 to do anything about it, and the

attackers claimed two victims along the way.

The reality is that it can take up to 240 days to discover an attack, according to Mark Gazit, CEO of ThetaRay, a national firm offering cyber security solutions. But, he adds, it can take a month or more for an organization to recover.

Then there's the fact that according to Andre Allen, information and cyber security manager at GCR Inc., hackers are targeting airports and no one seems to know why and what information they seek.

Dom Nessi, deputy executive director and CIO at Los Angeles World Airports, warns that though many airports excel in cyber security, just as many airports have a long ways to go to meet the challenges posed by today's cyber threats.

My question is this: If a single man with a can of gasoline and a lighter can cripple the nation's air traffic system, what could a group of organized criminals or terrorists accomplish if they breach airport networks? Could they halt air transportation altogether or worse cause a loss of life?

Don't let the warnings of Airport Cooperative Research Program (ACRP) ring true. This organization warns airports will be hacked eventually, and fears there will be a general lack of apathy until such an attack occurs.

It's time to step up and be proactive rather than reactive. Our nation depends on air transportation and our passengers rely on its safety.



FAA CONTINGENCY PLAN DURING CHICAGO FIRE

Currently, O'Hare is handling about 80 percent of its usual traffic volume. Midway is operating at 90 percent. Some airlines have reduced their schedules, but most are flying without any problems. The speed in which

airports were able to get back to capacity has much to do with the FAA's quick response to the incident. The FAA sprang into action and moved air traffic controllers to

other control centers to make up for the loss of the tower in Chicago and help planes reroute and land safely. The contingency plans worked well, say experts, who claim Chicago would still be shut down otherwise, leading to additional shutdowns elsewhere as well. The National Air Traffic Controllers Association released a statement saying the ordeal is one of the most challenging they have faced since Sept. 11, 2001. The FAA expects all operations to return to normal within a couple weeks.



It's the Responsibility of a Leader to Create the Market!

Airport Business has been the leader for 28 years and we look forward to leading the next 28 years!

If you have heard me say it once, you have heard me say it a thousand times: It is the responsibility of the industry leader to create the marketplace. So to better service the aviation industry, *Airport Business* magazine, stepped into the ring and over the past year unleashed a bold, new, cutting-edge look and as well as a refined editorial direction! Leadership is more than a word; it is a way of thinking and carrying oneself. At *Airport Business*, we see being an industry influencer as being a rock-solid leader. Leadership is something you can look up to and learn from. With that said, we have decided to make major improvements in our print and digital brands, beginning with our digital a few months ago.

While we all like to say we are No. 1 ... what does that mean? At *Airport Business* that means investing financially in staff and technology to offer superior digital and print products and ensure we bring the industry the information it needs and wants. Knowing we live in a multi-media world and you rely on more than magazines, we have invested in comprehensive multi-media branding to bring the right message, to the right audience in the right media. Whether it is our magazine, Website, daily eNewsletter, video newsletter, or other custom offerings, we can help you develop and maintain your leadership in the market.

We launched a state-of-the-art Website using responsive design technology that automatically knows what device you are using and adjusts the page to optimize your user experience. Even our graphics and ads are designed specifically for each device to ensure you get the information you need in the optimal design. Look at www.AviationPros.com or our daily eNewsletter on a tablet and rotate the screen. See how it goes between two columns and three columns

to optimize your reader experience? It also learns what you like to read and guides you to like editorial to enhance your experience ... pretty smart stuff! No more pinching in and out on your smartphone since it is optimized to the device to allow you to read, search information, products and articles. We do the work so you don't have to!

Due to popular demand, we have invested in improving our digital daily eNewsletter to keep you informed of what is happening every day in the aviation industry. Keep in touch with what more than 16,000 of your peers read to help keep them informed and subscribe today.

Since starting with the Cygnus Aviation Group in January, I have learned that *Airport Business* is a respected industry brand. We have spent countless hours (as I write this over the weekend) and financial investments to bring the *Airport Business* brand back to the leadership position we have held for 28 years. Talk is cheap ... many say they are No. 1 ... many use smoke and mirrors because they cannot compete. Make sure you are showing your leadership position, investing in your product and services to ensure it is best in the market, then make sure your message is shared with your clients. Be a leader by joining with *Airport Business* and helping the market grow.

Leadership is strong, leadership can be fun and entertaining at the same time, and leadership is bringing new technology to market. *Airport Business* magazine has been the leader for 28 years and we look forward to leading the next 28 years! While we are proud of what we have accomplished this year ... we are far from satisfied and have many new projects in the works to help you in your leadership role. Leaders lead. Let's lead the industry together!

Email me at Brett@AviationPros.com with your thoughts or suggestions of topics and technologies you would like to see covered in *Airport Business*. Together we will lead the industry and create the marketplace.



Asheville Regional Airport Dedicates New Public Safety Facility

Asheville Regional Airport recently held a commemorative ceremony to dedicate the airport's new public safety facility. The new building, which houses the airport's police, aircraft rescue and fire-fighting and communications center, opened after two years of design and construction.

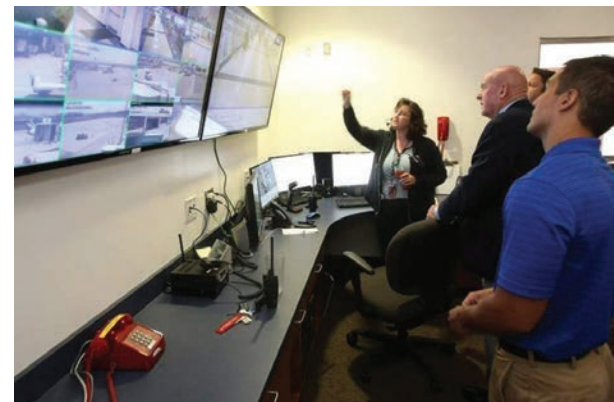
"This state-of-the-art public safety facility was designed specifically for the needs of the airport now and into the future," says Lew Bleiweis, A.A.E., Asheville Regional Airport's executive director. "As the airport has grown, so has our public safety service. More staff members and specialized emergency equipment are needed now than ever before."

As a commercial service airport, the FAA requires the airport to provide specific levels of rescue and fire service, based upon the largest types of aircraft serving the airport routinely, and the number of aircraft operations. Additionally, the airport's

passenger numbers continue to climb, and this upward trend is projected to continue.

"We now have improved access to the airfield with the new positioning of this facility," says Bleiweis. The new facility is located so that equipment and staff can respond to aircraft emergencies quickly, and emergency services personnel have access to unobstructed views of the airfield. The facility is also larger with a state-of-the-art equipment bay suitable for larger aircraft firefighting trucks, a centralized communications center that serves the entire airport, an emergency operations center, offices, a training room, dormitories and living space for public safety staff.

The airport's public safety facility was replaced for several reasons. The existing facility was nearing 40 years old and was built at a time when passenger numbers were lower, emergency equipment was smaller, and fewer staff and equipment were needed to provide services.



FAA and North Carolina Department of Transportation grant funds, as well as airport funds intended for aviation system improvements, covered the \$4.4 million cost. The airport is not funded by local taxpayers, so no local tax funds were involved in this project.

AIRCRAFT OWNERS AND PILOTS ASSOCIATION ...

Along with three other general aviation groups urged key members of the U.S. Senate to forgo legislation that could close St. Clair Municipal Airport near St. Louis.

AIREON LLC ...

Announces it has hired FAA executive, Vincent Capezzuto, as its chief technology officer and vice president of engineering.

AIRPORTS COUNCIL INTERNATIONAL-NORTH AMERICA ...

Unveiled the first group of collectible trading cards from the new North American Airport Collectors Series at the 2014 ACI-NA Annual Conference and Exhibition in Atlanta.

AMERICAN EXPRESS ...

Opens The Centurion Lounge in New York LaGuardia Airport.

ASHEVILLE REGIONAL AIRPORT ...

Breaks ground on a five-year, four-phase project that will involve replacing the current runway and adding a taxiway.

AVFUEL CORPORATION ...

Expands its branded FBO network with addition of Apex Aviation at Vernal Regional Airport in Utah and Wells Aircraft at Hutchinson Municipal Airport in Kansas.

BANYAN AIR SERVICE ...

Announces its partnership with Go Rentals, an elite car rental service company, at Fort Lauderdale Executive Airport.

BURBANK-GLENDALE-PASADENA AIRPORT AUTHORITY ...

Approves a \$1-million contract to better insulate 29 single-family and condominium-style homes from aircraft noise at Bob Hope International Airport.

CHARLESTON COUNTY AVIATION AUTHORITY ...

Issued a warning to anyone using their personal cars as taxis without taxi markings to get an airport permit or risk being ticketed, fined and having their vehicles impounded.

CHATTANOOGA METROPOLITAN AIRPORT ...

Starts a \$1.5 million upgrade that would almost double the size of its rental car lot.

CHICAGO DEPARTMENT OF AVIATION ...

Opens two new amenities for travelers at Midway International Airport—a yoga room and a mother's room on Concourse C.

DENVER INTERNATIONAL AIRPORT ...

Became one of the first North American airports to sign on to the Airport Carbon Accreditation program.

Hawthorne Global To Bring Customs Onsite At Atlanta Cobb County FBO

Hawthorne Global Aviation plans to offer U.S. Customs inspection at its Atlanta Executive Jet Center /Cobb County Airport FBO, with on-site staffing and a dedicated U.S. Customs inspection building. Cobb County Airport will be the first Atlanta metro-area general aviation airport to offer on-site U.S. Customs inspection and staff, with customs services available in 2015.

The new Hawthorne Atlanta FBO has more than 500,000 square feet of hangar space capable of accommodating up to G-650, a 6,000-square-foot passenger terminal, and first class amenities such as pilot lounges and conference facilities. Hawthorne Atlanta also features extensive services for pilots including computer flight planning, weather service and after-hours fuel and emergency services. It is a full-service Shell Aviation fueling station.



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Soar to New Heights at SDC2015

If you share any responsibility for scheduling and dispatching business aircraft – regardless of your position in the flight department, this conference and exhibition provides an invaluable opportunity to network with industry peers; access high-quality education sessions on topics including flight operations and emergency preparedness; as well as meet face-to-face with the vendors you do business with throughout the year.

Register by January 13 for the early bird discounted price of \$975
Non Member price after January 13 is \$1,525

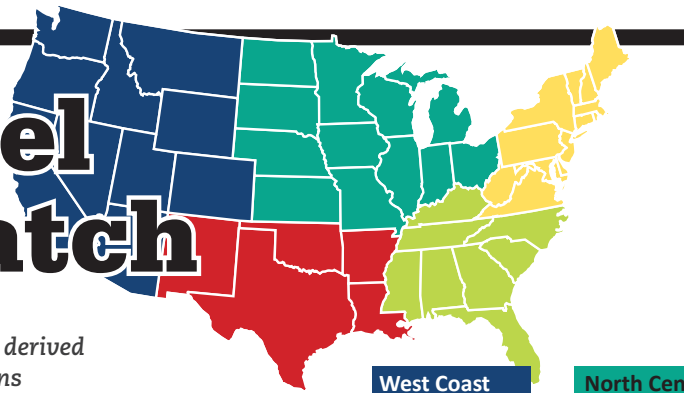
REGISTER TODAY: www.nbaa.org/sdc/airport



INDUSTRY NEWS

Fuel Watch

The following fuel prices were derived from transactions completed with the AVCARD credit card during August. Not all operations sell both jet-A and Avgas. The figures for jet fuel prices will be more representative than those for Avgas, due to the higher number of transactions recorded. Prices reflect all taxes and discounts. Data is supplied from AVCARD in consolidated format; individual transactions are not disclosed.



West Coast

Jet-A: \$5.26
Avgas: \$6.04

South Central

Jet-A: \$4.58
Avgas: \$6.06

Southeast

Jet-A: \$5.02
Avgas: \$5.99

North Central

Jet-A: \$5.01
Avgas: \$6.04

Northeast

Jet-A: \$5.33
Avgas: \$6.35

DUBAI INTERNATIONAL AIRPORT ...

Reports a record 6.6 million passengers in August.

ESTONIAN AIR ...

Has chosen German expert COMSOFT to supply advanced ARTAS to modify its surveillance systems as air traffic volume in the region increases.

FORT LAUDERDALE-HOLLYWOOD INTERNATIONAL AIRPORT ...

Opens a new \$826 million runway.

GREATER ORLANDO AVIATION AUTHORITY BOARD ...

Approves \$447.7 million budget for 2015.

HALIFAX INTERNATIONAL AIRPORT AUTHORITY ...

Signed an agreement with Irving Oil to install a temporary gas station on site, which will offer three grades of gasoline; a fully stocked convenience store; commercial card program; pay-at-the-pump technology; Air Miles Reward Miles; and 24/7 operations.

HMS HOST ...

Opens Minnesota Wild, named for Minnesota's National Hockey League team, at Minneapolis-Saint Paul International Airport.

HOUSTON AIRPORT SYSTEM ...

Announces free WiFi will be available in all terminals at Hobby Airport and in Terminals A and D at Bush Intercontinental.

IRS ...

Grounds plans to install sleeping pods in the C concourse at Ted Stevens Anchorage International Airport.

JETSUITE ...

Has been ranked No. 4 in total hours flown and No. 2 in aircraft utilization in a report by ARGUS International.

LEIDOS ...

Was selected by the Port of Seattle to provide implementation services for a comprehensive FOD detection system being installed as part of a runway improvement project at Seattle-Tacoma airport.

LOGAN TELEFLEX INC. ...

Announces a contract for a multi-million dollar baggage handling project at Ted Stevens Anchorage International Airport.

MASSACHUSETTS PORT AUTHORITY ...

Approves a \$30 million partial budget to create and/or reconfigure approximately 130,000 square feet at Terminal E to accommodate the A380.

MERIDIAN ...

Names Greg Johnson as its new director of business development.

MIAMI INTERNATIONAL AIRPORT ...

Becomes the first airport in the world to have a complete and open deployment of beacons.

80

COUNTRIES...

GARSITE

www.aviationpros.com/10017318

INDUSTRY NEWS

NEW PRODUCTS

MULTILINGUAL DIGITAL SIGNAGE FOR AUTOMATED PEOPLE MOVERS

Advanced Application Design Inc. unveils the ICONS (In-Car Orientation and Navigation System) line of digital signage. Specifically designed to replace scrolling LED signs on the inside of automated people movers (APMs) or light rail train cars, ICONS represents a major upgrade in communicating with passengers. ICONS high-definition panels are capable of displaying information in any language. They display images and other graphics in a bright, clean way, viewable both at very close and not-so-close ranges in the vehicle. ICONS offers a platform to generate new advertising revenues using a variety of media types—images, audio and video. Company logos can be shown to guide riders to visit the available concessionaires at specific gates. ICONS also can tie into existing vehicle speaker systems to provide audio wayfinding plus offer synchronized audio and video. ICONS technology is engineered and manufactured to withstand the rigorous heat, dust and vibration of an APM environment. For more information visit www.aadcorp.net.

www.aviationpros.com/11701471



JERVIS B. WEBB UPGRADES BAGGAGE HANDLING CONTROL SYSTEM



Jervis B. Webb Company upgraded its WebbView Integrated Baggage Handling Control System for airports. The improved WebbView includes

an enhanced graphic interface, mobile application and dashboards that can be customized to meet individual users' needs. WebbView has the ability to pull, configure, blend and share reports on any conveyor, at any time, on any date, for any flight in detail for the past 400 days. WebbView emphasizes software-to-operator compatibility, including a user interface that is fast, configurable and provides users a total view of the entire baggage management environment. WebbView is accessible (via confidential password) on any mobile device. For more information visit: <http://daifukuwebb.com/>

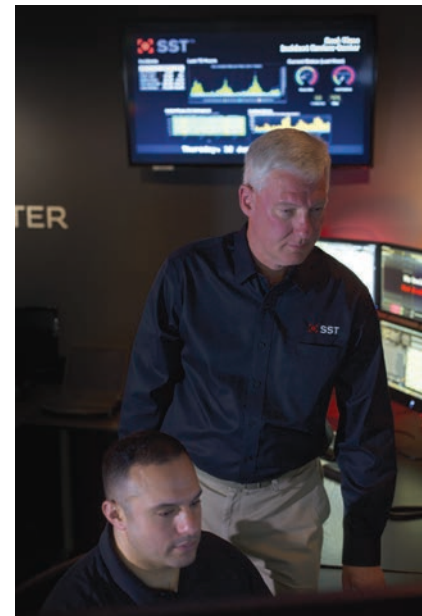
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BLUVISION LAUNCHES BLUETOOTH BEACON SOLUTIONS SUITE

BluVision Inc. launches BluZone, an end-to-end Bluetooth beacon hardware and Software as a Service (SaaS) platform for beacon management. The proprietary SaaS platform helps airports improve beacon performance, discovery, integration and management to simplify beacon mobile deployments and efficiency from a single portal. Quick to implement and easy-to-use, BluZone can be incorporated with the BEEKS line of Bluetooth Low Energy software and hardware, enabling airports to make smarter decisions and help achieve their business goals. For additional information, visit www.bluvision.com.

www.aviationpros.com/11701479



SHOTSPOTTER SOLUTION OFFERS 360-DEGREE PROTECTION AND SECURITY FOR AIRPORTS

SST Inc., the maker of ShotSpotter Flex and the global leader in gunfire detection and analysis, has extended its proven technology and service offerings with the launch of ShotSpotter SiteSecure for Critical Infrastructure. The new product is a reliable and cost-effective security solution designed to detect gunfire and explosive attacks on airports and other transportation hubs. It employs 360-degree detection system, providing a wide area of security coverage. ShotSpotter SiteSecure with "reviewed alerts" provides an instant alert service 24 hours, 7 days a week, 365 days a year. For more information visit www.ShotSpotter.com.

www.aviationpros.com/11701493

AUTOMATED FODETECT ENHANCES RUNWAY SAFETY

FODetect from **Xsight Systems** is an automated Foreign Object Debris (FOD) solution collocated with runway edge lights and is the most powerful solution available today to improve runway safety, operational efficiency and increase runway capacity. FODetect automatically and continuously scans operational areas and uses sophisticated image and radar processing algorithms to monitor runway conditions during day and night for FOD, wildlife and equipment status even during inclement weather. The system automatically separates birds from other FOD types, and then automatically alerts the airport's wildlife team in real time, day and night. The upgraded product enables remote real-time auditory bird deterrence, completing the cycle of runway bird management. FODetect also alerts operators, characterizes objects, assists with safe clean-up and allows incident tracking. For more information visit www.xsightsys.com.

www.aviationpros.com/11701486



INDUSTRY NEWS

MINETA SAN JOSÉ INTERNATIONAL AIRPORT ...

Hit 20 consecutive months of passenger traffic growth in August, with a 5.3 percent increase in travelers compared to the same month last year

MINNEAPOLIS-ST. PAUL INTERNATIONAL AIRPORT ...

Is looking at adding more gates, more parking ramps, better security lines and an on-site airport hotel.

MORPHOTRUST USA ...

Opens new centers for enrollment in the TSA Pre✓ program at Palm Beach International Airport, San Francisco International Airport, Denver International Airport and at Identigo Center by MorphoTrust in Raleigh, N.C., bringing the total number of enrollment centers to 302.

NEW ORLEANS AVIATION BOARD ...

Is awarded the Construction Manager at Risk Services contract for its North Terminal Airport Project to the Hunt Gibbs Boh Metro Joint Venture team.

NORWEGIAN ...

Launches nonstop service between London Gatwick and Orlando as well as between Copenhagen and Orlando.

SAN ANTONIO INTERNATIONAL AIRPORT ...

Welcomes back VivaAerobus with a non-stop service from Monterrey, Mexico, to San Antonio, Texas.

SAN FRANCISCO INTERNATIONAL AIRPORT ...

Awards a multi-year contract to AAAE's Clearinghouse for Worker Background Check Services and Biometric Fingerprint Capture.

SOASTA ...

Announces that Gatwick Airport has invested in its CloudTest platform.

SOUTHWEST AIRLINES ...

Helps kick off construction of the \$508-million Terminal 1 Modernization Program at Los Angeles International Airport in a groundbreaking ceremony featuring Los Angeles Mayor Eric Garcetti.

U.S. CUSTOMS AND BORDER PROTECTION ...

And the Hillsborough County Aviation Authority launched Automated Passport Control at Tampa International Airport.

VIRGIN AMERICA ...

Was recognized with the Best Overall Passenger Experience award in the 2014 Passenger Choice Awards.

WESTFIELD ...

Begins construction on a \$3.5 million transformation of the old food courts at Newark Liberty International Airport's Terminals A and B.

YEAGER AIRPORT ...

Announces non-stop flights to Orlando are returning via low-cost carrier PEOPLEExpress.

NEW FOD*BOSS SWEEP TRACKER APP FOR FOD SWEEPING OPERATIONS

Aerosweep PTY LTD launches a complimentary iPhone App to support the use of its FOD*BOSS Sweeper equipment. Aimed at increasing efficiency of FOD collection the new FOD*BOSS Sweep Tracker App also supports the upgraded next generation Phase 3 FOD*BOSS. Operations personnel can now track their entire FOD sweeping program by logging on to an online database which, using GPS technology, tracks and logs its user's sweeping operations. The App calculates the distance swept and areas covered by the FOD*BOSS sweeper; it then records this information together with the weight of debris collected by the operator, enabling comparison of one sweep to the next. In addition the user can watch a FOD sweep live via the App so enabling them to compare and monitor FOD Sweeps to ensure all areas of the airfield are covered. For more information visit www.fodboss.com/fodboss/app/.

www.aviationpros.com/11701515



GARSITE

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Command and Control

Los Angeles International Airport extends incident management to field operations with the NICE Situator Web Application

William Shakespeare penned “that a rose by any other name would still smell as sweet.” A similar tale could be spun for the airport control room. Though the name of this operational epicenter varies from airport to airport, it is the hub for all that goes on inside the fence. “It is the method by which airports share a common operating picture between those in the field and those in the control room,” says Chris Wooten, executive vice president of NICE Systems’ Security Group.

But when all the data goes to a central location, and there are 40 or so people in the field to share information with, key incident details might be missed—a fact that’s simply unacceptable in a mission-critical environment like an airport.

“The goal was to integrate the NICE Situator Control Room with the airport’s Geographic Information System (GIS) ... and put it in the hands of users in the field.”

**KEVIN CARLSON, VICE PRESIDENT,
AVIATION SYSTEMS, AECOM**

To ensure critical information readily flowed between its control center and airport operations employees, Los Angeles International Airport (LAX), which serves 66.7 million passengers annually, built a new operations center, dubbed the Airport Resource Coordination Center or ARCC, on the western side of the airport in 2011.

The airport equipped its ARCC with NICE Situator, which enabled it to integrate information from various security and operational systems, including video surveillance, CCTV and access control, and generate automated, adaptive response plans for personnel in the field to follow.

But though information sharing was vastly improved through these efforts, airport officials wanted more. “It received a lot of input from CCTV and our active control devices, but in many ways—even with all that input coming in—you don’t get a lot of eyes on the ground

feeding right into the ARCC,” says Dom Nessi, executive director and chief information officer at Los Angeles World Airports.

In May 2012, the airport sought to expand this system to ensure the boots on the ground (there are up to 45 operations employees roaming the airport with mobile devices in hand at all times) received key information in real time.

The airport selected NICE Systems and AECOM Technology Corporation to aid in this effort by extending the airport’s situation management capabilities from the control room to the field. “The goal was to integrate the NICE Situator Control Room with the airport’s Geographic Information System (GIS), which includes their physical infrastructure data about LAX, and put it in the hands of users in the field to extend it beyond just a command-and-control product,” says Kevin Carlson, vice president of Aviation Systems for AECOM.

In September, the airport reaped the fruit of this two-year development effort when it deployed the NICE Situator Enterprise Geographical Information System (EGIS) Web application, which enables field personnel to view all open security and operational incidents in Situator and log new incidents from their tablet computers. This system creates a shared environment for managing incidents, leading to better collaboration between teams, increased situational awareness for all operators and more effective responses, according to Nessi.

“Airport operations staff at LAX can now use iPads in the field to collaborate as they manage incidents, view critical information about the facility and the infrastructure, and communicate with the command center without radio,” says Carlson.

Nessi stresses the NICE solution allows the airport to transform the way it manages safety, security and operations. “Based on our

AIRPORT OPERATIONS

60 YEARS...



Using the NICE Situator Web GIS Application, LAX staff can collaborate on the map to draw and share information about incidents, such as a wildlife strike.

ongoing success with NICE Situator, we sought a way to apply these capabilities to our field operations," he says. "Now, not only are we able to maximize the use of our existing Physical Security Information Management (PSIM), situation management and GIS technologies, we are strengthening our entire security and operations apparatus."

FROSTING THE CAKE

A key element of the new system is its spatial capability, according to Nessi. "This is like the frosting on a really good cake," he says. "It adds a layer of data we didn't have in the system before."

The resulting Web application uses the sophisticated geospatial and mapping capabilities of Esri's ArcGIS Server to provide customized, layered views of airport buildings, property and infrastructure. With the system, all relevant stakeholders can visualize the same incident on a map and engage in interactive dialogue via the comments log. They also can share response plans, like an evacuation route, by drawing on the map, annotating it and saving it to the system.

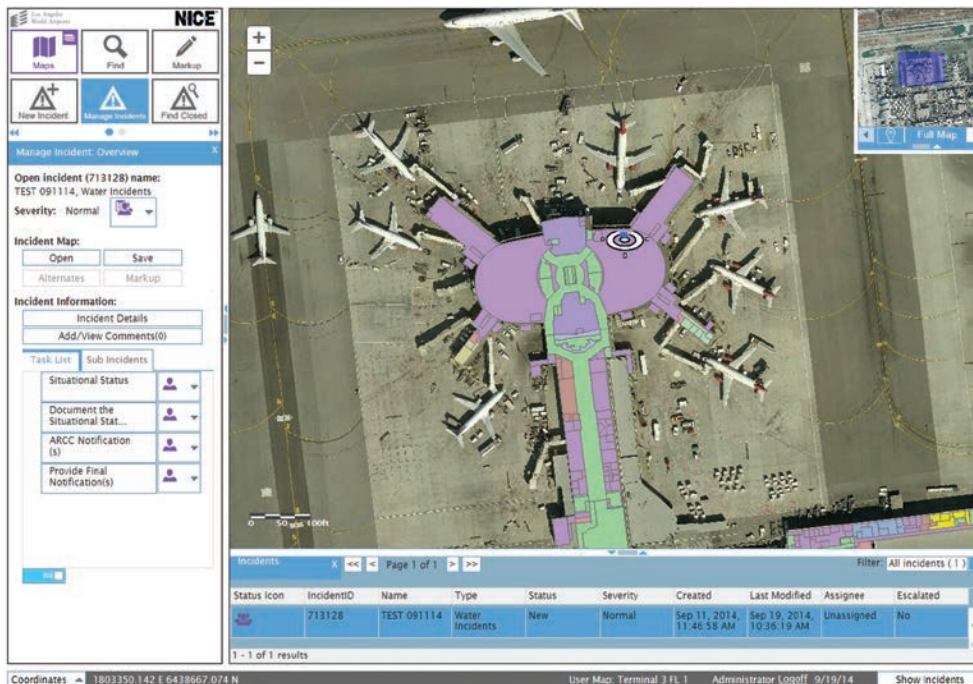
As operations personnel drive around the airport, the software on their mobile devices shows a dot that moves around with them similar to the way a global positioning system (GPS) shows a vehicle moving down the road. When they notice something that needs to be addressed, they can make a notation on the map.

Adding this GIS component changes incident response. Before, when an incident happened, folks in the field were notified by the command center via telephone and were verbally told where problem was. "If there was a fuel spill on the airfield, someone would radio that in, they would contact another person to clean it up, then that individual would go out and try to locate the fuel spill, follow procedure to clean it up, and make a text entry in a log somewhere," Nessi says.

Today, if a worker notices that same fuel spill, they can draw a picture on a map of where the spill is, submit the information to the ARCC, and it enters the system as an immediate incident that needs rectifying. Any personnel in the area can see the incident, and can follow the preplanned procedure as

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LAX Airfield and Terminal Operations can use the new NICE Situitor Application to respond to incidents, such as a water leak in a terminal, by marking the event and completing the SOP checklist on their iPad.

detailed on their iPad, and check off each step as its completed.

“I mentioned a fuel spill but the same process would be followed for leaking water in a terminal, an escalator out of service, or even something they see on the runway,” says Nessi. “Now all of our operations staff can see the incident in real time. The spatial data really helps. You can say there is water leaking in Terminal 1, but until you have an exact picture of where the water is, you can’t do anything. Now they can not only report it, but they can take a photo of it and attach it

to the work order so that people in the ARCC see exactly what they’re seeing in the field.”

Nessi adds that this information helps the airport avoid redundant work orders for the same incident. “If they see something while they are out there, they can check the system to see if a work order already has been placed,” he says.

The Web application also helps field operators efficiently manage day-to-day tasks, such as FAA-mandated Part 139 airfield inspections. Under Federal Aviation Regulations Part 139, U.S. commercial service airports are required to conduct various assessments of each runway; examine pavement markings, lighting, signs and safety areas; and oversee ground vehicle operations. If an issue arises, field operators can easily create a new incident on their mobile devices, which is resolved through Situitor’s workflows and recorded for compliance purposes.

THE POWER OF GIS

“GIS in a traditional sense serves as almost an archiving function for engineering data,”

says Carlson. “A taxiway was built, a bunch of airfield lights were put in place, and some infrastructure was installed underground. All of that information went into a GIS and sat in a database for engineers to access.”

By allowing operations personnel to access GIS information, Carlson says the system gives them real-time access to all data about the facility and its infrastructure. “You can’t separate operational events and incidents from the infrastructure you’re trying to protect or enhance,” he explains.

By adding the GIS layer to the system, workers have a map that contains critical infrastructure that helps them determine their response. They can immediately pull up assets in an impact zone—for instance, a video camera within 100 feet of the incident—or use the application’s robust search engine to search for nearby geospatial assets, such as the exits closest to an incident location. They also can create new incidents, manage ongoing ones and complete specific tasks assigned to them, reducing reliance on radio communications and enhancing compliance.

The NICE system also contains standard operating procedures for a host of common incidents so that workers know what to do when they encounter them.

“That’s part of the analysis process that we do. We work with our operations staff to determine the critical processes to include,” Nessi says, noting that the system allows authorized personnel to add processes or update procedures as necessary.

SITUATION ANALYSIS

Besides streamlining the work order process, the NICE system also stores data for reporting and analysis.

Consider an aircraft wildlife strike, which Carlson says happens several times a week at a busy airport such as LAX. Previously a worker would have recorded information about this strike, which would have included notes about the type of wildlife, the time and the estimated location. Today, workers mark the strike’s precise location on a GIS map, fill in detailed data about the incident, giving the airport a complete incident record. With all incidents of this type gathered into one system, airport officials can compare incidents, see patterns, and plan a course of action.

“This is like the frosting on a really good cake. It adds a layer of data we didn’t have in the system before.”

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The software also ties into the airport's tenant information. Every time the LAWA Commercial Development Group assigns a new tenant to a space, all information about that tenant including contact information is

added to the system. So if for example a suspicious bag is found within a terminal, and the airport needs to create a perimeter around it, the system gives them ready access to all tenants in the area, including their phone

numbers. "Rather than rely on a printed contact directory and a paper map, they can readily see who they need to contact in that area and the numbers to reach them at," Carlson says.

"One of the real advantages is you have a full record of any actions that are taken," he continues. "If you have a suspicious bag, and someone uses their mobile device to plot the incident at 10:03 a.m., then at 10:07 a.m. they elected to take a second step and secure the area, you can see that four minutes have passed. This time-stamped record of the actions that were taken, the comments that were exchanged, and the information that they were using gives them the ability to fully reconstruct the event."

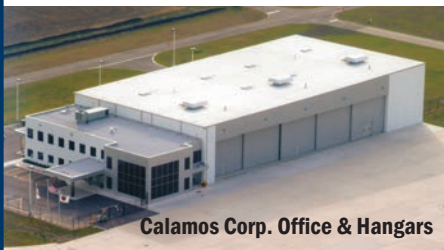
The system not only records what's taking place in NICE Situator but other things going on such as what happened with the radio or telephone system and what the scene looked like. "This gives us a more comprehensive understanding of what occurred," says Nessi. "Just looking at a few reports doesn't give a full context of what an individual was hearing or seeing at the time of the incident."

This allows duty commanders at the start of their shifts to review high priority events that took place during the last eight hours. And it helps them to perform a post-incident analysis for debriefing. "We find our customers always want to understand how they handled that situation," says Wooten. "Did they handle it according to standard operating procedures? Did the response go well and if not do they need to change their response for the future? They can say we did something but it didn't work well, and how can we change the procedure so that the next time we do it, we handle it in a more efficient and effective manner."

He continues, "Extending the reach of NICE Situator into the field significantly augments security operations. In a dynamic airport environment like LAX, it is critical to maintain a direct line of communication between multiple users by providing situation management capabilities both inside and outside of the control room. This model for mobile situation management demonstrates NICE's leadership and technology innovation, which can be tailored to the needs of other airports and industries as well."

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Airports: Safe Havens?

I really think that the airports of America provide the most pleasant part of the entire trip

The “hassle factor” of airline travel has not gone away, and shows no signs of going away. It’s a stressful means of travel. The combination of TSA, smaller seats, buying tickets online, getting to the airport on time, parking, checking or toting bags then waiting because of delays, getting through security and—well, you know the deal. It all adds up.

As near as I can tell, most everybody is trying like hell to do better. It’s just all too much to overcome.

But there is a haven in this mess: it’s the airport itself. Once you get inside and get through security, the world changes. It’s like that feeling I loved back when I was young and water skiing (I got all the way to the Georgia State Water Skiing Tournament and came in 13th in the men’s division. There were 15 contestants.). At first the boat dragged me through the water, the spray hit me in the face and the drag stretched my arms—then, magically I rose to the surface, the water became smooth, and life was wonderful. Lawd, that was a good feeling.

I usually feel that way about airports—after the hassle is over and I’m inside. The truth is, I like airports. When my work is finished in a town, you might find me hanging out at the airport, hours before my departure flight.

Once inside, I can read, eat, check my email, call Wife Gail, work on the laptop, and even nod off a bit. The stress is over for awhile. It isn’t necessary to worry about city traffic making me late to the airport, I’m already there.

Airports provide the most “normal” environment in air travel. This is an important part of the entire trip, and airports can be—should be—proud of providing a bit of relative tranquility to the much-harassed traveler.

And airports continue to improve. Free WiFi is becoming the norm, now, as are free battery-charging locations. Retail merchants provide a wide variety of products and services, and the prices seem to be a bit less rapacious than in the past. Most importantly, you can usually find what you forget to bring—but must have for your trip—even if it does cost a bit more than at Walmart.

Wife Gail called once to ask if I meant to leave all my ties on the bed. No, I didn’t, but no problem, I bought one at the airport. I’ve bought a phone charger at an airport, batteries, allergy medicines, aspirin, some goo to hold in the crown that

broke off my tooth and a myriad of other things. I’m a sucker for a good headline (or lovely lady) on the cover of a magazine, ice cream cones and a zillion other things.

The stress will come back, of course, particularly if my flight is delayed and fear arises about missing the connecting flight in Atlanta, but my time at the airport is usually right peaceful for awhile

In short, I really think that the airports of America provide the most pleasant part of the entire trip and I appreciate it.



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Know the legal issues of social media use to maximize its benefits without risk

If you're running an airline, an airport or an FBO, chances are you'll be using some form of social media—be it Facebook, Instagram, Pinterest, LinkedIn or Twitter—to build your brand.

These tools help enhance the passenger experience, grow revenue, and build passenger loyalty in a global economy. However, social media also exposes aviation users to a variety of legal issues.

"Social media involves a combination of several types of law," says Linda Emery, a shareholder with von Briesen & Roper, a Wisconsin law firm with experience in social media litigation. "Employment is probably the single most litigated area of social media, but there are also contract law issues, securities law concerns, and intellectual property law components as well.

"One of the things we see most frequently is people copying content off the Internet and thinking that it's OK. They don't understand that there are copyrights associated with things they're posting," she continues. "You see it all the time with YouTube, where people think just because it's on YouTube they can take it and use it in any way they want, and they can't."

According to Emery, savvy organizations know the legal pitfalls of social media and put policies and practices in place to mitigate their risk.

SHARE AND SHARE ALIKE?

Avoiding legal issues begins with developing a solid plan for what your organization hopes to accomplish via social media, according to Rowan Childs, director of social media and client services for Pop-Dot Marketing, a Madison, Wis.-based marketing firm that helps clients develop their Web presence.

"They need to know what they are trying to do and how they want to present themselves,"

she says, stressing that if they enter the space too quickly—without solid planning—they may make mistakes that open them up to legal litigation.

Content for social media requires careful consideration. Airport managers must determine the types of information that are acceptable and unacceptable to post, and communicate these guidelines to everyone. "Things that would not be acceptable include politics, religion, and anything too racy or sexual," Childs says, adding it's also unacceptable to insult other businesses or their products.

According to Emery, everything that's posted needs to be fair and accurate. "The most common legal issue involves overstating products and services; things that can get you into a dispute with a competitor and can be a very expensive proposition," she says. "If you put something out there, and it turns out that it is not true, you could get into trouble."

When sharing information, it's important to know copyright laws and adhere to them. "I taught a class a couple of months ago, and the first question I asked the people in the class, who were going to be journalists, was if they could copy everything that was on social media sites. They said, 'Yes,' " she says. "All of them were wrong. Copying stuff from other people's sites is a problem. That's something to look out for. You can't post it if you don't know who owns it."

Emery says posting links to information is OK, but putting up content without permission is not. "Remember, whatever you post on your site is fair game for litigation," she says.



"Copying stuff from other people's sites is a problem. That's something to look out for. You can't post it if you don't know who owns it."

LINDA EMERY, SHAREHOLDER, VON BRIESEN & ROPER

There are FTC guidelines covering a company's use of social media. Endorsements or testimonials, for example, must disclose whether the person who is responding is an employee of the company. Likewise, if someone complains about content, business users need policy in

place to take the issue offline and get it resolved.

Sometimes social media sites offer giveaways, contests or sweepstakes, and Emery cautions there are rules for this as well. Most social media sites detail these guidelines. “You see it all the time. Companies ask visitors to take a specific action, such as like their page or share a post, to be part of the contest,” she says. “But the law is very clear about that. You can allow people to volunteer to be part of the contest but you cannot ask them to do something as a condition for entering it.”

In addition, only certain individuals should be tasked with posting and monitoring social media. “If they are doing the posting in-house, there needs to be authorized people in charge of it, and only those people should be posting,” says Childs. “You don’t want everyone to have access to your social media page.”

Finally, checks and balances should be instituted to ensure nothing slips through the cracks. “We hear about things that happen by accident all the time; someone forgot to do something, a photo that should not have been posted slips through,” she says. “If you have a strategy and a plan, at least you know what posts are planned for the next two weeks. Planning things out can avoid some costly mistakes.”

Childs emphasizes that once mistakes happen, the information is out there forever—even if you take it down. “What you post or don’t post needs to be part of the strategy, and there must be specific people in charge of that.”

RULES OF ENGAGEMENT

Controlling what others post to your social media sites is also a concern, according to Emery. “What happens if you have someone posting on your social media site and they’re saying a lot of really negative things? What are your legal rights?” she asks.

Airports, airlines and FBOs need to develop rules of use for their social media pages. These rules should give them the authority to remove posts they find unacceptable, offensive or untrue. “The rules should say, ‘We reserve the right to take down any content that we find offensive,’ ” she says. These rules should also include a privacy policy.

“Your first line of defense is to go to the social media site itself. There’s an email form you fill out when you find something offensive and you can ask to have it taken down,” she says. “They

STRATEGIES FOR SOCIAL MEDIA SUCCESS

SOCIAL media marketing is a great avenue to build your brand, but to be successful your social media strategy should be aligned with your brand’s message and goals. Business writer and marketing consultant, Jack Rivera offers the following suggestions in “5 Tips to Maximize Your Social Media Marketing” to help businesses harness the power of social media.

- ▶ Create an attainable social marketing plan. Know what your goals are for social media then develop a strategy. Set sensible goals with a realistic timetable.
- ▶ Identify the types of exposure your brand needs. This will help you determine which social networking sites best address those needs.
- ▶ Post exciting content. Keep the audience engaged by posting original, engaging and exciting content. Publish on a regular basis to keep people coming back.
- ▶ Make it a customer service arm. Social media use can extend your customer service. Rather than call a hotline number, customers often will use social media to make inquiries and launch complaints. It’s important to answer these queries and be as helpful as you possibly can.
- ▶ Follow and tag influencers. By tagging influencers to relevant posts you broaden your reach, especially if they share the content with others.

are pretty good about removing things, but it might take a couple days.”

Monitoring what others post is an essential part of social media. “There needs to be someone dedicated to checking posts, monitoring messages and looking at notifications,” Childs says. “If you don’t have someone checking and taking action as needed, how many people will see it before it comes down?”

POLICY AS PROTECTION

“The most important thing is to have a social media policy as part of the employment handbook,” says Emery. “This policy should detail how the employees represent themselves in the public domain.”

Naomi Angel, a partner with the law firm, Howe & Hutton Ltd., spells out the elements of a social media policy in her presentation “Managing Risk in the World of Social Media. According to this document, policies should:

- Clearly address what is prohibited activity,
- Detail how social media will be monitored and audited,
- List what the company will have access to in terms of company email and texts, as well as what can be released to third parties, and

- Include employee acknowledgment of receipt and understanding of the policy, and a waiver of privacy when using company property.

A policy isn’t something that can be developed and then ignored. According to Emery, these policies should be revisited annually, and employees regularly reminded of them. “Technology is moving so fast so if you don’t update it with a fair amount of regularity, you can get yourself into a world of hurt,” she says.

If employees are found to be in violation of the policy, Emery indicates the company should follow the same disciplinary policy they would use for anything else. “Depending on the severity of the behavior, you would typically go through a disciplinary process where the first offense is an oral warning, then a written warning, moving up to a suspension or termination,” she says.

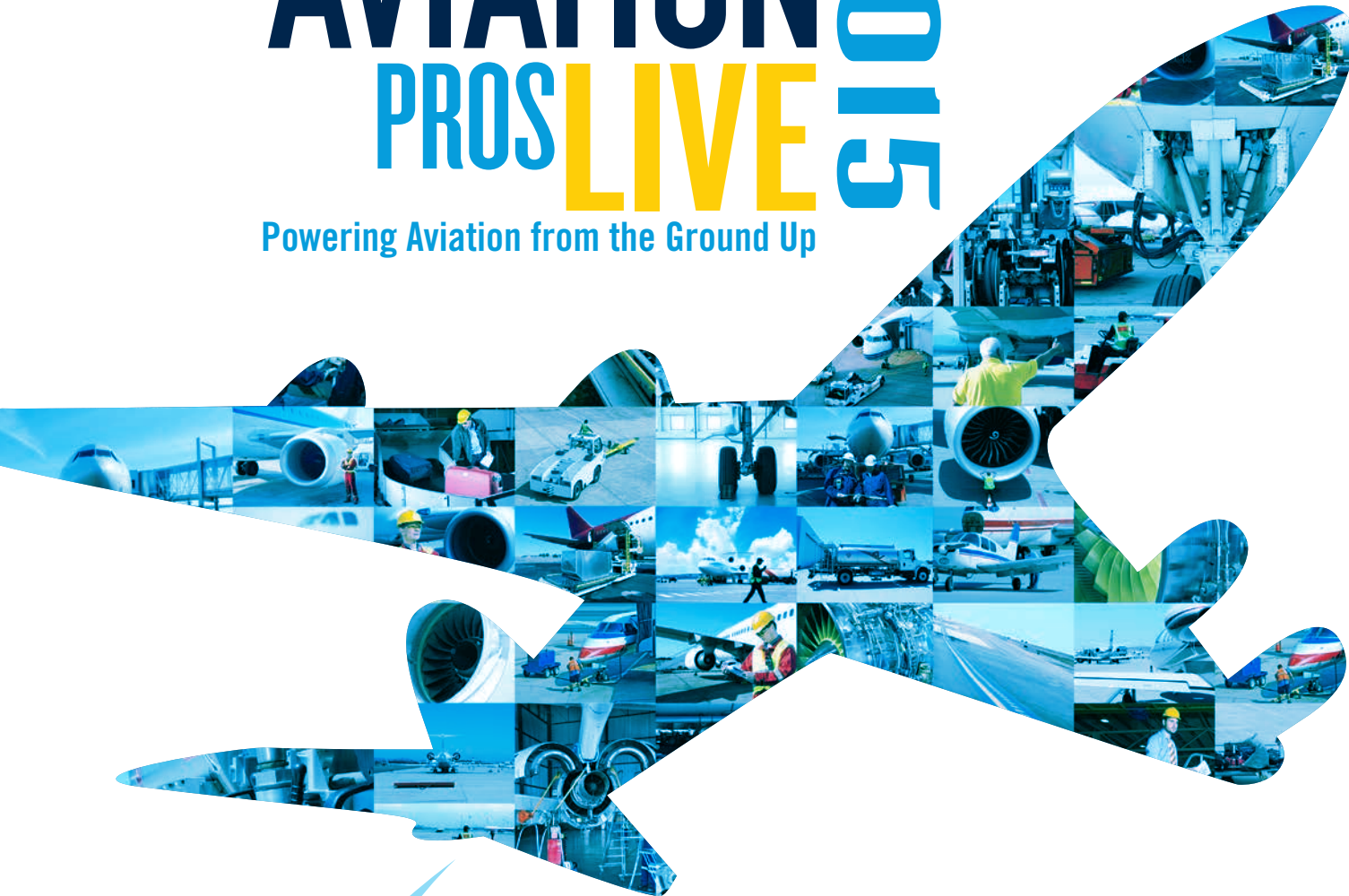
When using social media, it’s important to know the law and react accordingly. Those who do that will be able to take advantage of all the benefits that social media has to offer. Those who don’t may be putting themselves at risk.



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CYBER INSECURITY

Attacks against cyber security networks are increasing. Experts warn it's time for airports to boost their digital defenses

The headline read: “Nation State-sponsored Attackers Hacked Two Airports, Report Says.”

This headline appeared in June after a cooperative effort between the federal government and the Center for Internet Security (CIS) thwarted a prolonged operation to spy on aviation systems at 75 U.S. airports, but not before hackers breached the networks of two of them.

Authorities actually discovered this threat in 2013, when the federal government notified CIS about an advanced persistent threat (APT) targeting airports.

Typically APTs involve Nation State attackers employing sophisticated methods to creep

around a network for as long as necessary to obtain the information they seek. In this case the attackers sent spear phishing emails to aviation personnel containing vulnerabilities that the CIS reports were difficult to detect and execute.

This is not a rare event; in fact it's one that is happening far more frequently than ever before. According to the annual CIS report, there were 48 significant computer security incidents in 2013, more than double the number recorded in 2012.

It's also something that's striking globally. In late September, news media reported hackers broke into the server of India's largest airport operator, the Airports Authority of India, and stole crucial data including financial information, payroll data, and more.

“Here's the scary part about these incidents: They are attacking and targeting airports—and nobody really knows why,” says Andre Allen, information and cyber security manager at GCR Inc., an international software and technology firm in the airport space.

Not only that but, according to Mark Gazit, CEO of Theta Ray, a national firm offering cyber security solutions, the average time to discover a threat is approximately 240 days. But, he adds, it can take a month or more for an organization to recover.

Even more concerning are the words of Dom Nessi, deputy director/chief information officer at Los Angeles World Airports (LAWA): “I think

KEYWORDS IN CYBER SECURITY

- ▶ **Advanced persistent threat.** An advanced persistent threat finds a hole in a network that allows hackers in so they can sit back and monitor what an airport is doing.
- ▶ **Cyber hygiene.** Steps computer users can take to improve their cyber security and better protect themselves and their organizations online.
- ▶ **Malware, short for malicious software.** Software that compromises the operation of a system by performing an unauthorized function or process.
- ▶ **Phishing (spear phishing).** An attempt to acquire sensitive information such as usernames, passwords, and credit card details by masquerading as a trustworthy entity in an electronic communication.
- ▶ **Virus.** Computer program that can replicate itself, infect a computer without permission or knowledge of the user, and then spread or propagate to another computer.

airports have a long ways to go, both in the United States and internationally, to meet the challenges of today's cyber threat. That's not to say that individual airports haven't excelled in terms of cyber security, but many airports still have work to do."

CAUSES OF CYBER INSECURITY

Dr. John McCarthy, cyber security fellow at Cranfield University and head of research with the International Centre for Airport Cyber Research, says airport systems are extremely vulnerable to attack for three key reasons:

- Airports are very political environments with many different stakeholders. Just getting all the stakeholders in the same room to discuss a common problem can be an issue, he says,

"Here's the scary part about these incidents: They are attacking and targeting airports—and nobody really knows why."

ANDRE ALLEN, INFORMATION AND CYBER SECURITY MANAGER, GCR INC.

adding that many times all those managing vulnerable systems aren't even included in the discussions about cyber security.

- **The Cloud.** As airports migrate to the Cloud, it's critical to know who owns the data and how it's being managed. But those things are not always considered, he says.
- **Airports are cost driven.** Without adequate funding, airports might not invest in the technologies and people needed to secure their networks.
- **All airport systems, from the baggage handling system to the moving walkways to security cameras, reside on a single network, and can be remotely controlled—a boon for system operators but an inherent security risk.** "There are multiple operations, from multiple vendors, all residing on the same network," McCarthy says. "But these systems were never designed to put on public networks and it's a huge problem."

Couple those issues with the explosive expansion of broadband and you have a problem of epic proportions. "Now everyone is on the

Internet. Everything is accessible from everywhere at all times," he says. "But we haven't embraced this in terms of our own security."

WHERE VULNERABILITIES LIE

According to Nessi, safety and security systems, baggage and handling technology, and the building's facility control systems are attractive targets for cyber crooks. But in stark contrast, says McCarthy, most airport cyber security efforts focus on the traditional IT network, and not on these systems.

"Recent technological developments and moves to increase efficiency have resulted in the merging of traditional IT networks with SCADA (Supervisory Control and Data Acquisition Systems). Now airports often have homogeneous networks that are bolted together with cyber security as an after thought," explains McCarthy in "Cybersecurity: Keeping Cyber Secure."

This phenomenon means that some of the more innocuous appearing systems pose the most risk. For instance, many people would not lump industrial control systems into their cyber vulnerabilities. But HVAC, airfield lighting, automated parking systems, automated people movers, and baggage systems all provide entry points into an airport's network.

"These systems are at risk because most people don't think that they are being targeted," Allen says. "They don't even think of them as being connected to the Internet. If you don't at least start looking at your risk associated with your critical systems and putting some controls around them, you're very vulnerable."

Another area to consider, says McCarthy,

is the airport Website. McCarthy recently performed a hacking demo at an airport in Rome where he breached their Website and placed a message on it. "A hacker could cause colossal damage to an airport through a system most people don't even think to protect," he says. "They hack into the Website, change your parking URL to a nearly identical one that they own, send out a phishing email to your customers telling them they'll get 50 percent off their parking if they book online, and all of this money goes to the hackers. And they haven't even touched the IT system in the airport!"

DIGITAL DEFENDERS

Nessi recommends taking the Defense in Depth approach to cyber security. Defense in Depth is defined as the coordinated use of multiple security countermeasures to protect the integrity of an organization's information assets. The idea is that it's more difficult to defeat a complex and multi-layered defense system than to penetrate a single barrier.

Defense in Depth minimizes the probability that malicious hackers will succeed by employing a well-designed strategy that aids system administrators and security personnel in identifying attempts to compromise a computer, server, proprietary network or ISP (Internet service provider). Should a hacker gain access, Defense in Depth minimizes adverse impacts and gives administrators time to deploy new or updated countermeasures to prevent recurrence.

This strategy utilizes antivirus software, firewalls, anti-spyware programs, hierarchical passwords, intrusion detection and biometric

DOM NESSI'S TIPS FOR BETTER CYBER SECURITY

- ▶ **Hire good cyber security people to monitor your systems.** Those certified by (ISC)2 have the training needed to adequately protect IT data and systems.
- ▶ **Place cyber security professionals in the right areas.** They need to be in a position to oversee IT operations and the IT environment in an unfettered manner.
- ▶ **Give cyber security experts the authority** to raise issues that might be unpopular.
- ▶ **Remember cyber security is a 24/7 business.** You have to commit to dealing with it 24 hours a day, seven days a week. "Cyber security is an issue that impacts your board, your C-level suites, your technology, etc. It's not just your IT people," he says.

verification. “On your perimeter, you have firewalls and intrusion detection systems, and a variety of systems that monitor and protect your network,” Nessi says. “You have technology to protect your data and technology to protect your applications. You have technology that protects your interaction on the Web. You have technology that protects your desktop environment. And now we have technology that protects our mobile devices.”

Allen recommends also adding application wide listing to the airport cyber security arsenal, noting that this technology can prevent up to 80 percent of the threats trying to sneak in. This technology locks down a computer so that it will only operate those applications a user needs to perform his or her job. If a user clicks on an email containing malware, the malware won’t execute and the technology quarantines it. “This gives network administrators time to respond and deploy their defenses,” he says.

Though technology used in the Defense in Depth strategy aids in early detection by looking for suspicious network activity, it may not be enough and threats may still slip through. Gazit stresses, “Early detection is one of the biggest holes in cyber security today. It’s unacceptable to think about an airport or an airplane that doesn’t have smoke detectors. But we don’t always have cyber attack detectors in airports. Yet detection is an extremely important part of cyber security.”

And while technology can cull through the network looking for suspicious activity, human eyes still need to review these logs every single day, warns Nessi. “Analysts need to look at these logs to see if there is anything there,” he says. “If they think there is something going on, they need to report it.”

THE HUMAN FACTOR

“People forget the Internet was built with very few safeguards internally. It was built for transmitting traffic in data packets. It was built to facilitate communication. The human element of it has made it a dangerous place to be,” Nessi says.

For this reason, Defense in Depth also includes employee training and education of employees. LAWA provides annual cyber security training for its workers. Says McCarthy, “We need to educate all levels of the organization in sound simple practices. Airports could stop

ANDRE ALLEN: HOW TO BUILD YOUR DIGITAL DEFENSES

- ▶ **Figure out where you are.** “What is the current state of your cyber security?” he asks. What are you protecting currently? What vulnerabilities exist?
- ▶ **List the systems that you have.** Allen recommends classifying the systems by asking the following questions:
 - What kind of systems are they?
 - Are they critical systems? These would be systems that if down could cause major disruptions or a loss of life.
- ▶ **Prioritize protection.** After identifying the systems, determine which are most critical to protect. “You can’t do everything—that’s a given,” he explains. “Nobody has enough funding to do everything.”

90 percent of all cyber security issues by properly training all members of the organization.”

Nessi agrees: “Most problems start at home. You need to make sure your organization is educated and you have policies in place.”

The Multi-State Information Sharing and Analysis Center is considered by many as ‘the’ focal point for cyber threat prevention, protection, response and recovery for the nation’s state, local, tribal and territorial governments. This CERT organization offers Web-based training that Allen says can greatly enhance employees’ cyber security knowledge.

Training should cover good cyber hygiene, which McCarthy describes as everything from password protection, to phishing emails, to forbidding the use of USB devices. He explains that most people see USB devices as secure but they are actually one of the most common ways to infect a network. “People plug those into a machine and format them, which erases evidence of a virus, but by then it’s already contaminated the system,” he says.


LAWA also monitors traffic to see what employees are doing on the network and blocks sites such as Facebook and Twitter because as Nessi says: “Not only are they distractions but there is the potential for malware on these sites.”

“The utilization of your organization’s system is not a personal right of an employee,” he explains. “Anything and everything done on a work computer is subject to review by

the organization. Probably 50 percent of all organizations allow some personal browsing on the Internet as long as it doesn’t interfere with work. But in other organizations that’s prohibited. Every organization has a different threshold for risk.”

Acceptable use policies presented at orientation teach employees what their limits are, according to Allen. “You have to start with policies so that at least employees know what they can and cannot do,” he says. “They know that these are the things they will be accountable for.”

The caveat, however, is that “none of this will happen without any money,” he adds. “If you’re not going to fund it, then you’ll just wait until you get hacked. And airports will get hacked eventually. That’s one of the things the ACRP (Airport Cooperative Research Program) said upfront. They said there will be apathy until an attack occurs because there is a lack of direct economic incentives to do it.”

But as Target and Home Depot learned when their systems were breached, the economic impact can be in the hundreds of millions of dollars. “The moment they start understanding the connection between cyber security and their business, they’ll get serious about the funding,” he says. 

A photograph of two scientists in a laboratory. A man in a white lab coat and safety glasses is leaning over a desk, looking at a computer monitor. A woman with long brown hair, also wearing safety glasses and a white lab coat, is sitting at the desk looking at the monitor. The background shows laboratory equipment and shelves.

Tim Shea: Innovating to Bring Unleaded Avgas to the World

Aviation gasoline development manager helps Shell produce an alternative to leaded Avgas

Motorsports involves extreme competitiveness, where every fraction of a second is important, and missteps along the way can change a competition's outcome. Tim Shea, aviation gasoline development manager for Shell, says that for him the research and development of new fuels is very similar.

"I like to do things that no one else has ever done before," he says. "That's why I helped develop unleaded fuels for motorsports. That's why I like working on developing an alternative fuel for aviation gasoline (Avgas). Nobody's done it before, so it's a good place to be."

In this game of both knowledge and skill, Shell emerged as a front runner in December 2013. With Shea at the helm of its aviation fuel research and development efforts, the global supplier of aviation fuels and lubricants became the first major oil company to develop a lead-free replacement for Avgas, which is now being evaluated in strict regulatory approvals process.

Airport Business chatted with Shea recently to learn more about the new fuel, the testing results they've seen, and where the alternative fuel stands in the regulatory approvals process.

WHAT IS THE HISTORY OF SHELL'S WORK ON AN ALTERNATIVE FOR LEADED AVGAS?

Our work goes back a long way. It began as a motorsports project in 2004 when we were looking for an unleaded fuel that could replace the leaded fuels in the U.S., Canadian and Australian motorsport markets, where leaded race fuels were still commonly used.

In 2008, we completed that work and launched those fuels. It was then that we noticed how the Avgas sector was also under a lot of pressure from the EPA to remove lead. We decided to transfer the technology we used in motorsports fuel to an Avgas product. That work began in earnest in 2010-2011.

WHAT WERE SOME OF THE CHALLENGES IN DEVELOPING AN UNLEADED AVIATION FUEL?

There are two primary areas that make that challenging. The first one has to do with storage stability. Aviation gasoline tends to be stored for long stretches of time. Because of that, you have to be very specific about the types of molecules you put into the fuel to ensure that they don't evaporate too quickly. Motorsports has the opposite problem.

The other part has to do with the specifications of the fuel. In motorsports, there really is no specification, it's open. You design a fuel that works the best, and that's about it. In aviation gasoline, there is a specification for the current leaded product—ASTM D910. This specification

shows all of the current grades of Avgas and provides the physical properties they need to meet to be sold as that grade. We wanted our fuel to, if not match the grade for 100 LL exactly, be as close as possible to it. That is where the challenges came out because aviation gasoline has to be able to withstand very cold temperatures. We had to modify the fuel to give it the low temperatures properties of Avgas.

WHAT KINDS OF RESULTS ARE YOU SEEING WITH THE ALTERNATIVE FUEL SHELL HAS DEVELOPED?

Our fuel is within the ASTM test specs range, which is quite a wide specification. There are still variants in the fuel being tested. The idea behind our initial flight tests was to demonstrate that the fuel was compatible enough to pass the initial checklist in terms of compatibility with the aircraft and the engine. This testing centered on whether there were any noticeable differences between our fuel and 100 LL. The data we've gotten back so far shows that the differences are indistinguishable. The pilot—who controls the fuel flow to the engine, experiences the condition of his aircraft, and typically fuels it—can't tell there's a different fuel in the aircraft. The alternative fuel should be a drop-in type of fuel so that when you use it, you don't know that you're using a different fuel.

WHAT IS THE TRUE DEFINITION OF A DROP-IN FUEL?

Our take on the definition of a drop-in replacement fuel is that everything from once the fuel is blended and ready to ship, to how you transport it, store it, fuel the aircraft, and how it performs in the aircraft should all be indistinguishable from 100 LL today.

But it really depends on what your frame of reference is. If you're the pilot, you want to know if you put this fuel in your aircraft will you notice anything different? Does it run the same way? Do you fly the aircraft the same way you used to with 100 LL? A drop-in replacement should be completely transparent to the pilot.

But an OEM will have a different definition for a drop-in fuel. OEMs want to make sure the alternative fuel is compatible with all the materials it comes into contact with for the long term. Aircraft can be out there in the marketplace for decades so long-term compatibility is key. Most people take it as a given that you're going to meet the engine performance part in terms of how

ON THE CHALLENGES OF DEVELOPING A NEW FUEL...

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ON WHEN AN ALTERNATIVE FUEL MAY BE AVAILABLE...

... it's a very large undertaking. You're looking at effectively certifying a fuel for every engine and aircraft in the United States.

the fuel combusts in an engine. But the biggest questions are more long term. How does the fuel handle itself when it's exposed to fuel handling equipment, storage systems, and distribution over decades?

WHAT SAFETY ISSUES DID YOU HAVE TO MEET IN DEVELOPING THIS FUEL?

This has to do with the initial tests with the OEM. The engines are usually pretty straightforward because, for the most part, they're metal, so they're not that sensitive to fuel chemistry over short durations. For airframes, it's obviously a different story because they're going to be flying.

The typical path you would take is to test the fuel against all of the fuel wetted components. Anything that's in that aircraft that would come in contact with the fuel needs to be tested for compatibility. Depending on the OEM, sometimes we do that testing here and sometimes the OEM does that testing at their location, and we just ship the fuel to them.

That's where the safety checklist comes in before we can fly. There are two parts to this: One, we essentially need a note from the engine manufacturer that the fuel is suitable for that engine, so it's not going to detonate. Then we need the materials compatibility data.

If they do their own testing, they're going to convince themselves. If we have to do it, we need to put together a report then have a series of calls with them where we walk them through the data, answer their questions, and perform follow-up experiments to demonstrate compatibility that is sufficient for their airframe. It's quite a process, and it can take upward of a month or so to iron out all the questions.

WHERE IS SHELL'S REPLACEMENT FUEL IN THE APPROVAL PROCESS?

There are two parts to the regulatory approval process. The FAA ultimately does the certifying. The FAA involves the American Society for Testing and Materials. The ASTM has a subcommittee that looks after fuels and lubricants, and within that subcommittee, there's another subcommittee that looks at aviation and where these specifications fall.

If you think about the current product, the ASTM D910 specification, that's an ASTM specification. What the FAA does is say, "All right. That specifies the fuel." That tells you the composition the fuel might have, its physical properties

and such, and really defines what the fuel is. Then the FAA takes that specification and certifies it. That's how it works, they're hand in hand. We're obviously pursuing both in parallel.

We are working through ASTM, and there are two steps there. There's a test specification, which is a preliminary step. It just gives some definition of the space that our fuel chemistry looks at but it's still very broad because as testing goes on we may need to modify or make some changes here and there. It gives us that flexibility. Then once we complete that testing, we go into what's called a production specification. That's the final piece. We're generating the data now to go after that production specification.

In parallel to that, the FAA has their own program that started on July 1, where a number

of companies submitted proposals to enter that program and then at the end of August a smaller set of companies was invited into a phase of that program. This program is designed for certification of the fuels.

In the FAA's, very near-term view, it appears that this is the primary vehicle to achieve certification, which is why we're participating in that. There are two phases. One revolves around materials compatibility, physical property testing, and so on. The second phase involves engine and airframe testing. The idea behind that is to generate the data sets required to support certification.

HOW FAR OUT DO YOU THINK WE ARE FROM HAVING AN ALTERNATIVE FUEL?

That is the real crystal ball reading. We are attempt-

SHELL'S FLIGHT PATH TO UNLEADED AVGAS

SHELL became the first major oil company to develop a lead-free replacement for Aviation Gasoline (Avgas 100 and 100LL) in December 2013, after which the fuel began a strict regulatory approvals process. Avgas is one of the last common transportation fuels to contain lead and is used by light aircraft and helicopters. Shell's new lead-free formulation comes after 10 years of exhaustive research and development, as well as successful initial testing, carried out in the last two months by two original equipment manufacturers (OEMs).

Xinsheng (Sheng) Zhang, vice president of Shell Aviation, says: "We are proud of this first for Shell Aviation. This advanced product is the latest milestone in our long history of innovation. We believe that with industry support, a stringent approvals process can be completed for this new lead-free product within a short time-frame. We look forward to working alongside our technical partners and authorities to progress the necessary approvals needed to make this product a reality for use in light aircraft engines of all types."

Avgas currently includes lead in its formulation to meet fuel specifications and boost combustion performance (known as Motor Octane rating). Shell has developed an unleaded Avgas that meets all key Avgas properties and that has a Motor Octane rating of over 100, an industry standard. The development of a technically and commercially viable unleaded Avgas that meets these criteria has been seen by the aviation industry as a significant challenge, due to the tight specifications and strict flight safety standards that it has to adhere to.

To get to this stage, Shell Aviation technologists carried out an intensive internal laboratory program, including in-house altitude rig and engine testing. Working alliances were then formed with aviation engine manufacturer Lycoming Engines and the light aircraft manufacturer, Piper Aircraft Inc. As a result, the formulation was successfully evaluated in industry laboratory engine (bench) tests by Lycoming and in a flight test by Piper.

Shell will now engage the aviation industry, regulators and authorities, including the FAA, American Society for Testing and Materials (ASTM) and European Aviation Safety Agency (EASA) to achieve approvals for the unleaded Avgas. Shell expects to also work with other OEMs to continue the testing and refinement program as the approvals process progresses.

ing to work with the FAA at every corner to see if there's any mechanism to move that forward faster. But there is a lot of work to be done because it's a very large undertaking. You're looking at effectively certifying a fuel for every engine and aircraft in the United States.

There is another mechanism to certify fuel, which involves using supplemental-type certificates. However, it's believed that this is not really the primary vehicle for certification. But it's important to note that there is another process out there and people are free to attempt to certify in that way. If that happens, you're more likely to see very limited certifications in the works. You might see people going for certificates for a specific engine and airframe but you're not going to get the fleet-wide certification you need to commercialize.

WHAT ARE THE BENEFITS IN DEVELOPING A SUSTAINABLE ALTERNATIVE TO AVGAS?

The main one is the removal of lead. If you think about transportation fuels, Avgas is the last fuel that uses lead. Everything has lost it over the years. The primary reason for that is it's obviously well-known as a neurotoxin, and it bioaccumulates, which means it gets out into the environment and stays there. If it was biodegradable, you probably wouldn't see near the level of attention it's receiving now.

HOW DO YOU MAKE SURE THE FUEL IS REPRODUCIBLE IN REQUIRED VOLUMES AT A PRICE THE AVIATION INDUSTRY CAN AFFORD?

Another key element in the ability to bring an unleaded fuel to market is to make sure that the fuel is actually producible in the volumes required. Different people are looking at very different ways of manufacturing, and with some very new components that are not all from refineries. It's not just a question of, "Do you have the right materials and can you get enough of the materials?" It's also, "Are all the materials in the right places?" If there's a chemical or something you need, and it's only made in China, that could be a problem if you're making a fuel for Europe or the United States. It's a very complex undertaking that often gets lost in the discussion. It is not just about making a fuel chemistry that will work. It's about being able to actually produce it and supply the market with that fuel. This fuel also needs to be affordable.

This is one of the key parts to our program. We

didn't just look at making a fuel that will satisfy an engine in an airframe and look like 100 LL. It was about, "How can we do this and actually supply the market place?" That meant the materials used for that fuel had to be widely available. We don't want to get into the business of having to build plants to make something new. We weighed everything out—performance, storage, distribution and manufacturing—all of it. We are confident we have the right chemistry, as well as the infrastructure, to make unleaded Avgas a reality for use in light aircraft engines of all types.



"The alternative fuel should be a drop-in type of fuel so that when you use it, you don't know that you're using a different fuel."

TIM SHEA, AVIATION GASOLINE DEVELOPMENT MANAGER, SHELL

FAA SELECTS FOUR FUELS FOR TESTING

THE FAA has selected four unleaded aviation fuels to undergo initial testing at the agency's William J. Hughes Technical Center. The goal is for government and industry to work together to have a new unleaded fuel that reduces lead emissions for general aviation by 2018. Two fuels developed by Swift Fuels and one fuel each developed by Shell and TOTAL will undergo laboratory and rig testing beginning this fall and concluding in fall 2015.

"We're committed to removing harmful lead from general aviation fuel," says Transportation Secretary Anthony Foxx. "This work will benefit the environment and provide a safe and available fuel for our general aviation community."

In July, fuel producers submitted their replacement fuel proposals to the FAA for further evaluation as part of the Piston Aviation Fuels Initiative (PAFI), an industry-government initiative designed to help the general aviation industry transition to an unleaded aviation gasoline. The FAA assessed candidate fuels in terms of their impact on the existing fleet, the production and distribution infrastructure, the impact on the environment, toxicology, and the cost of aircraft operations.

"The FAA looks forward to our continued work with fuel producers to make an unleaded aviation gasoline available for the general aviation fleet," says FAA Administrator Michael Huerta.

Based on the results of the phase-one laboratory and rig testing, the FAA anticipates that two or three fuels will be selected for phase-two engine and aircraft testing. That testing will generate standardized qualification and certification data for candidate fuels, along with property and performance data. That entire testing process is expected to conclude in 2018.

Approximately 167,000 general aviation aircraft in the United States rely on 100 low-lead aviation gasoline for safe operation. Low-lead is the only remaining transportation fuel in the United States that contains lead, which is considered a toxic substance. The small quantity of lead in the fuel creates the very high octane levels needed for high-performance aircraft. Most commercial airplanes do not use leaded gas.

PAFI is facilitating the development and deployment of a new unleaded aviation gasoline that will have the least impact on existing piston-engine aircraft. PAFI will play a key role in the testing and deployment of an unleaded fuel across the existing general aviation fleet. Congress authorized \$6 million for the fiscal year 2014 budget to support the PAFI test program at the FAA William J. Hughes Technical Center.

NOW ARRIVING: A Better Airport Wireless Experience

Passpoint networks at U.S. airports deliver seamless, secure WiFi connectivity



**here's no contest:
Passengers' favorite
travel companions
today are their
connected devices.**

Nielsen recently found that travelers are more likely to own smartphones and tablets than the general population, with 75 percent owning a smartphone and 44 percent owning a tablet. These devices are their lifelines to work, family and friends, entertainment and the vital travel information they need at their fingertips. And few things are more frustrating—and anger inducing—for travelers than having to fumble with WiFi passwords or reset their wireless settings to get connected when seconds count before a flight takes off.

New wireless standards are arriving at major airports across the United States that will make these occasional wireless annoyances history. Called Passpoint, the technology is a revolutionary new set of wireless protocols that enable seamless, secure, automatic WiFi access, with no user action needed. Passpoint networks have the power to fundamentally change the way consumers connect to WiFi, doing away with public WiFi network log-ins and browser redirects, dramatically improving the experience of connecting to WiFi.

Developed by a joint task force of leading wireless industry trade groups and more than 75 of the world's biggest wireless providers, including AT&T, BT and Time Warner Cable, the Passpoint standards are finally moving rapidly from years of lab testing to consumer venues. Airports are leading the charge and pioneering Passpoint adoption across the United States. In the first quarter of 2014, 23 of the largest airports in the United States, including Chicago O'Hare, JFK, LAX and Austin-Bergstrom International, launched secure Passpoint networks with wireless partner Boingo Wireless, making this improved wireless experience available initially to power users and soon to all travelers.

With Passpoint-enabled networks launching throughout cities such as San Francisco and San Jose, and across service provider networks like Time Warner Cable's 33,000 U.S. hotspots, tech-savvy travelers will soon come to expect the ease and safety of Passpoint connections. Airports large and small will soon need to ready their networks for the coming Passpoint revolution.

THE PASSPOINT EXPERIENCE

The Passpoint protocols were developed in response to the huge data onslaught in the

advent of the smartphone to enable seamless access to WiFi networks, making offload from overtaxed cellular networks to fast and available WiFi networks possible.

With improved consumer experiences at the heart of the standards, Passpoint delivers a number of benefits to passengers and airports:

Seamless, Secure Customer Experience:

Travelers with a Passpoint profile installed on their late model device can enjoy an

automatic connection from the moment they enter the airport or step off the plane. By the time their device knows WiFi is available, they're already online. The Passpoint networks also provide a WPA2 (WiFi Protected Access) encrypted connection automatically, ensuring enterprise-level security, with no additional software or Virtual Private Network (or VPNs) needed. In short, travelers get connected faster to a safer network—

PASSPOINT GLOSSARY

GETTING to know Passpoint? Here are some essential terms to know and love:

- ▶ **Passpoint:** Passpoint is the WiFi Alliance's trademarked brand designating that hardware or a device is Passpoint compliant, meaning it has passed interoperability testing against the Hotspot 2.0 technical specification.
- ▶ **Hotspot 2.0:** Hotspot 2.0 is a hardware industry specification designed to simplify public WiFi connections. This technical specification defines the minimum core technologies for automatic, secure connections to public WiFi networks.
- ▶ **Next Generation Hotspot:** Next Generation Hotspot is an initiative within the Wireless Broadband Alliance (WBA)—the global organization for WiFi network operators—to enable public WiFi networks for seamless, secure connections using Passpoint-certified hardware, and network integration best practices defined by the WBA and its members.
- ▶ **Passpoint Worldwide:** Passpoint launched at consumer venues for the first time in the first quarter of 2014, and has since gained momentum. Today, you can find Passpoint-enabled networks from the following providers, which is just the start of an industry-wide roll out.
- ▶ **Boingo Wireless:** Boingo launched networks named "Passpoint Secure" at 23 leading airports throughout the United States, including LAX, Chicago O'Hare, New York's JFK and LaGuardia, and Austin-Bergstrom International, among many others.
- ▶ **Time Warner Cable:** Time Warner Cable launched 33,000 Passpoint-enabled hotspots throughout the United States for its customers. Boingo and Time Warner Cable also have partnered on a roaming agreement, making each other's Passpoint networks available to customers.
- ▶ **Cities of San Francisco and San Jose:** The cities have announced that their municipal WiFi networks are Passpoint-enabled, and users with a Passpoint profile installed will be able to roam onto both cities' networks seamlessly.
- ▶ **Passpoint International, via Orange Poland:** The wireless carrier launched a Passpoint-enabled network at Warsaw Royal Gardens, the largest park in Poland.

a vast improvement on today's connectivity experience.

Improved Accessibility for All Passengers: The Passpoint protocols were designed with inter-operator roaming in mind. Passpoint networks can be leveraged for cellular network offload, ensuring load balancing that keeps customers on both the WiFi and cellular networks connected and happy. The networks also can be used by other service

An important by-product of this new seamless, secure connectivity is a reduction in complaints and questions to airport staff about the airport networks.

providers to augment their services—such as Time Warner Cable's recent roaming agreement with Boingo that will give millions of Time Warner customers access to Boingo's "Passpoint Secure" airport WiFi networks as soon as they walk in the doors of the terminal.

Future Revenue Potential for Airports: With Passpoint, the infrastructure is in place for seamless access by potentially millions of users. With an automatic connect—that is paid for by a primary service provider, like a wireless carrier or cable operator—Passpoint has the power to create an incremental revenue opportunity for the airport and service providers alike, even when free WiFi service is available.

Happier Travelers, Better Connections: An important by-product of this new seamless, secure connectivity is a reduction in complaints and questions to airport staff about the airport networks. Travelers who can simply connect, send those last important emails, and download work files before the flight without having to hassle with network permissions

and settings can spend spare minutes at airport concessions, and airports can reallocate staff time from network troubleshooting to enhanced customer care or other operations duties.

Seamless connectivity doesn't mean that airports lose the ability to connect with travelers through their devices. The Wireless Broadband Alliance, one of the leading industry groups behind the standards, is currently in advanced policy management trials, which are designed to ensure that venue and network owners can still offer personalized wireless experiences to patrons, and keep that connection with the customer between the digital and physical worlds.

PREPPING FOR PASSPOINT

Creating a truly ubiquitous Passpoint connectivity experience does require network investments, ranging from new hardware to firmware updates, and continued support from popular device manufacturers for the Passpoint standards.

Airports looking to offer the most advanced connectivity experiences should assess their networks and consider the following:

Network Upgrades: Passpoint networks require hardware supporting the Hotspot 2.0 technical specification created by the WiFi Alliance, which makes the seamless hand-off between networks possible. Networks that have not been upgraded in the last three or more years might need updated access points installed. Networks that have been updated with new access points in the last 18 to 24 months may be able to support Hotspot 2.0 with a quick firmware upgrade. Airport IT departments should do a full survey of their current network to determine Passpoint readiness, and the steps necessary to get there.

Capacity Considerations: As more wireless carriers and device manufacturers support Passpoint connectivity, potentially millions more travelers each year could seamlessly connect onto an airport network—and networks will need to be ready to handle the demand. While WiFi network upgrades are essential to enable Passpoint, airports should also consider installing or upgrading a cellular Distributed Antenna System (DAS) network at their airport. DAS networks provide additional

coverage and capacity within large-scale venues like airports, where high consumer and data traffic can cause network congestion. DAS and WiFi networks are complementary to one another, and Passpoint connectivity makes the transition from one network to another invisible to the user.

Managing Passpoint: Though by definition Passpoint can make instant, invisible switches between networks, those seamless connections are a product of pre-negotiated roaming agreements, and sophisticated network configurations. Airport IT staff or airport wireless partners will need to be well versed in the Wireless Broadband Alliance's Interoperability Compliance Program (ICP) defining roaming protocol standards and implementation, may need to negotiate service provider roaming agreements, and will need to closely monitor network performance.

With major airports, tech-savvy cities, leading wireless providers, and major device manufacturers, such as Apple and Samsung, embracing Passpoint, the next generation of wireless connectivity has officially arrived. Travelers will soon come to expect the invisible, secure connectivity as a standard technology amenity on the road. With recent trailblazing network launches at some of the highest traffic airports in the nation, airports are poised to be pioneers in this new era of wireless.



ABOUT THE AUTHOR

Dr. Derek Peterson,
Chief Technology Officer

As chief technology officer, Derek Peterson is responsible for building and operating Boingo's core technologies and systems, including Web applications, client software, networks, authentication, billing, business intelligence and IT infrastructure. He leads the company's efforts in deploying Passpoint networks at consumer venues nationwide. Peterson holds a Bachelor of Science degree in computer science from the University of Maryland, a Master's degree in education and technology from American Intercontinental University, and a doctorate in computer science with a focus on enterprise information systems from Colorado Technical University.



Aviation Academics

The Northeast Tennessee Aviation Initiative aims to attract students to aviation careers while attracting businesses to the airport

Good things are happening in the Tri-Cities area (Kingsport, Johnson City and Bristol) of northeast Tennessee, thanks to good people working together for a grassroots project they founded themselves: The Northeast Tennessee Aviation Initiative. I've never seen a project gain so much support so fast from such a wide cross-section of people.



The mission of the Aviation Initiative is "To promote development of aviation-related skills and knowledge through the collaboration of local academic institutions, civic leaders, government officials, corporations, communities and aviation advocates."

If that sounds like a dream, you should see what this initiative has accomplished since it was founded by three men over a table in July 2013. These men are far from being dreamers. They are Tennessee State Rep. Tony Shipley, Bell Helicopter training/support manager Richard Blevins, and aviation/education advocate Henry (Hank) Somers, a member of the

Bell execs flew in on a helicopter to announce the firm's collaboration with Northeast State Community College to develop an aviation curriculum.

American Society for Quality (ASQ) and a pilot.

This all started in February 2013 when ASQ members took a tour of Bell Helicopter's facility in Piney Flats, Tenn. This facility sends finished, made-to-customer-order helicopters around the world. Bell—employing approximately 500 people in northeast Tennessee—is a primary industry for the region and our nation while also improving our national balance of trade.

On that tour, Somers learned Bell only hires a small fraction of its employees from the local area. That is certainly not because Bell doesn't want to hire locally, but because, as Blevins explains, Bell requires skills that are scarce in the local area. That got Somers interested.

Bell was importing employees. If local schools taught the required skills it would help the local economy and help Bell.

Somers knew that the aviation industry tends to attract other aviation industry—Wichita, Kan., is a perfect example—and Bell's success in the local hiring market would attract other aviation industry. Schools, by offering skills-based courses, would gain new students. Not all young people want to go to college and not all good jobs require a college degree. New courses could train students for interesting jobs that pay well. Tri-Cities Regional Airport would see an increase in traffic and help attract businesses to the industrial parks on the airport—Aviation Parks I and II—as most aviation firms require airport locations with airport access.

BUILDING SUPPORT

More tours followed with top community leaders including Dr. Janice Gilliam, president of Northeast State Community College; Patrick Wilson, executive director of Tri-Cities Regional Airport; Shipley and other regional leaders. Blevins' Bell tours continued to stir up interest.

Less than a year after the Aviation Initiative was founded, Northeast State Community

College and Bell announced their collaboration for an education curriculum to help aviation and other industrial jobs take off in northeast Tennessee. The announcement was made at the site of the college's future \$35 million technology complex abutting Tri-Cities Regional Airport. Bell flew to the site in a beautiful red, white and blue helicopter—which was quite appropriate, considering that the event took place the week before July 4.

The Aviation Initiative has built a hardworking steering committee that looks like a “Who’s Who” of local leaders from government, industry, colleges, high schools, elementary schools and airports. The Aviation Initiative includes top leaders from Northeast State Community College, Bell, Tri-Cities Regional Airport and a variety of other top community, state and area leaders.

Nobody involved has been asked to donate money for the Aviation Initiative. Each participant is involved because the success of the

AVIATION INITIATIVE **THE MISSION**

of the Aviation Initiative is “To promote development of aviation-related skills and knowledge through the collaboration of local academic institutions, civic leaders, government officials, corporations, communities and aviation advocates.”

initiative will benefit the participant.

Bell will save money on recruiting and have input for courses offered by the schools. The schools will gain students. The media see economic growth which will provide them with more revenue. The airport will benefit from increased traffic. Advanced Flight Training hopes to provide flight training. Government always has an interest in more jobs and a better economy.

TENNESSEE PROMISE

Another important factor is the recently passed “Tennessee Promise.” The Promise is that Tennessee high school graduates can go to college for two years at no cost (details can be found by searching online for Tennessee Promise). To get in, students must do the paperwork. To stay in, they must maintain satisfactory grades (a 2.0 average at a community college) and perform eight hours of civic service per school

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Tri-Cities Regional Airport expects the Aviation Initiative to increase traffic and attract businesses to airport-based industrial parks.

term. This is not a free ride. Commitment and work are required.

The Tennessee Promise is expected to greatly increase student enrollment, and colleges are expected to compete for those students. This is evidenced by schools like Northeast State Community College, which will start this fall with basic industry courses and will have an aviation curriculum by the fall of 2015.

K-12 schools will “feed” prepared students to two-year colleges, which will feed to four-year colleges those students who want a four-year degree. One of the critical goals is to visit grades K-12 and get the students excited about aviation careers. Bell was already doing this before the Aviation Initiative was formed, thus providing a kick start for the program.

As Blevins points out, getting students excited about working in aviation is one thing—keeping them excited is harder, but necessary. Everyone hopes that students will be interested

“We keep telling [young people] to go to college and get a degree, versus getting the skills that are necessary to get a job. Diplomas count less and specific skills count much more.”

DENISE RICE, MANAGER, CORMETECH

in qualifying for well-paid jobs that are also fascinating, but, as Blevins points out, they must then stay interested for the long run.

STEM SKILLS

The required skills are not acquired overnight. The Aviation Initiative wants to provide area youth with an alternative pathway to a successful career, but it requires commitment to travel that path.

The skills required for these jobs are taken from the successful STEM program—skills in Science, Technology, Engineering and Math. A new Brookings study—including Chattanooga, Tenn.—indicates that jobs requiring STEM skills are the hardest jobs for employers to fill, and that a person with STEM skills, but no college degree, is-- and will be--in higher demand than a person who has a degree, but no STEM background.

Jonathon Rothwell, a fellow at Brookings, points out that “...workers with no STEM knowledge or post-secondary degrees compete with many qualified candidates for a scarce number of jobs.”

Rothwell expects the gap in earnings and unemployment between STEM and non-STEM workers will get worse unless more technical training is provided in schools. Indeed, a recent broadcast on public radio reported that college grads are currently competing with teenagers for fast-food jobs.

Denise Rice, a manager at Cormetech in Cleveland, Tenn., tells school groups: “I have jobs I can’t fill.” In a recent interview with *Edge* magazine, Rice said, “We keep telling [young people] to go to college and get a degree, versus getting the skills that are necessary to get a job.” She tells students that “Diplomas count less and specific skills count much more.”

Brookings reported on jobs advertised by 52,000 companies in the first quarter of 2013. In metro Chattanooga, 16.2 percent of job vacancies last year were for technical jobs not requiring a college degree, but paying, on average, more than \$50,000 per year.

In the past, high school students were divided between students headed for college degrees and those who were not. Perhaps they couldn’t afford college, perhaps they didn’t want college.

The reasons didn’t matter. What mattered was that they couldn’t see a non-college pathway for a better life.

Kids today are fascinated with smartphones, computers and other electronic devices. Aviation jobs include the newest of this tech and they are “jobs that make a difference.” The question is: Can our youth be taught to see the pathway offered, and will they commit and stay committed?

Northeast Tennessee includes many small towns with parents who lament the fact that their kids must move away to find a “good” job. The Aviation Initiative can help greatly by creating area jobs for youth who will commit and stay committed.

The Aviation Initiative already has the cooperation of leaders at the top, and is working hard to get the message across to students. Aviation Initiative people know the problems and the rewards, and are enthusiastic—to an almost fanatical degree—about this program.



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Advancements In Green GSE

As airports look to become more sustainable, it's essential to know what their partners on the ramp are doing. Here are a few new developments that promise to take the GSE industry down a greener path.

We've heard the old chestnut that there's nothing new within the GSE world more often than not. The truth is there is always something new to discuss about the future of GSE product development. Here are just a few of the advancements we've heard about recently, all with a particularly energy-efficient theme:

LITHIUM

Last year, the Idaho National Laboratory, a U.S. Department of Energy research operation, pitted lithium batteries against the commonly used flooded lead-acid batteries used throughout the GSE industry.

"Validation testing previously had not been performed within fleet operations to determine if the performance of current advanced batteries is sufficient to withstand the duty cycle of electric baggage tractors," according to the report's introductory remarks.

A rigorous day-to-day GSE vehicle performance test was set up with Southwest Airlines' ramp operations at Ontario International



1. The Corvus lithium battery pack, with a specially designed container for the tractors. 2. A tractor integrated with the battery pack. 3. The Corvus battery integrated into a tractor with additional ballast weight for the six-month test.

Airport. The lab used four of the airline's baggage tractors with the help of John Salter, reliability analyst for GSE with Southwest and Tony DiLuccia, lead GSE technician for operations at ONT.

"No alterations to the fleet operations were made for the baggage tractors under test in order to allow for comparison with other GSE fleets," the report says.

Corvus Energy Limited was chosen to supply the lithium-based battery packs used for the test. Corvus created a prototype battery pack configured with three battery modules in parallel with a junction box and vehicle control unit. Each module contained 24 series-connected cells in order to allow for a similar voltage range as currently used within the baggage tractors. The three modules and junction box were placed in a structure that was specifically designed to fit the battery cavity of an airport baggage tractor.

Two of the tractors had the Corvus batteries while the other relied on flooded lead-acid batteries.

Minute-by-minute logs of battery usage information were collected for each battery over the duration of the demonstration to gain a better understanding of how the different battery chemistries handle the duty cycle of a ground support baggage tractor. To accomplish this, the BIM needed to have a means for monitoring, recording and communicating to the data server. It was determined that the desired information to be communicated was cell voltages, pack voltage, pack current and pack temperature. For the FLA battery packs, this meant that the BIM hardware would contain the proper circuitry and software to monitor and record:

- 20 high-voltage leads placed on the positive terminal of every other cell of a 40-cell, 80-volt nominal pack in order to record intermediate cell voltages and full battery pack voltage.
- Pack charge and discharge current via a bus bar, connecting two battery cells and acting as a shunt.
- Battery temperature with a thermistor placed on the pack.

For the Corvus battery packs, each module was sealed without a means to connect the BIM analog circuitry to the modules. However, the Corvus BMS internal to each module communicated analog data for maximum and mini-

mum cell voltages, module voltage, module current, module temperature, and module state-of-charge via the BMS CAN bus. Because the BIM also had to be connected to the Corvus CAN bus for charging, all analog data were taken from each module's BMS using a secondary CAN bus on the BIM.

Since the Corvus lithium battery pack weighed in at 500 pounds, about 2,700 pounds less than the flooded acid battery, the weight difference was addressed with the addition of ballast and steel plate. Over the course of six months, battery usage and charging data were collected from four eGSE baggage tractors.

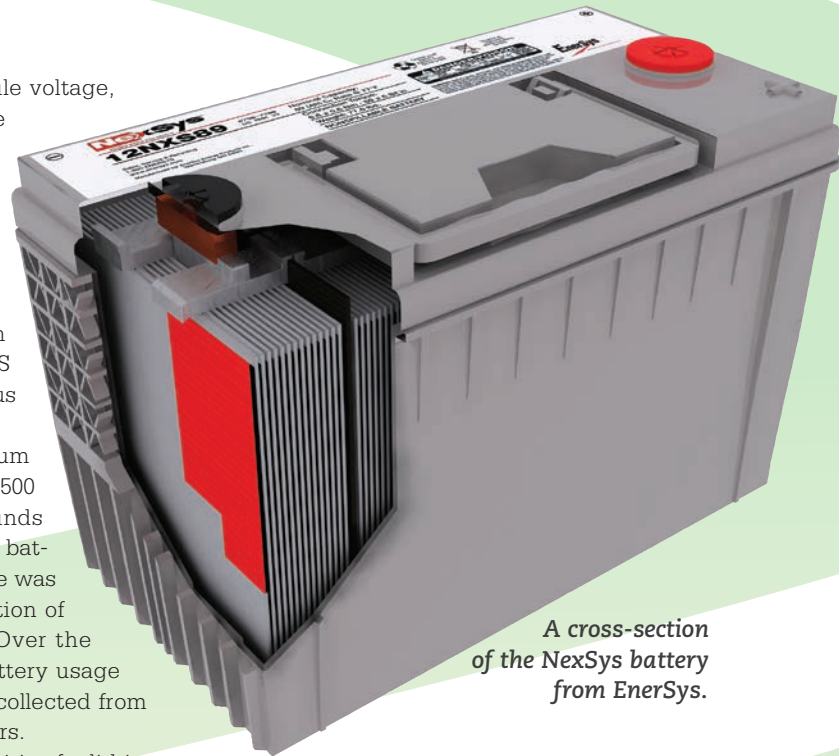
The results proved positive for lithium.

"The lithium battery packs can accept a full charge current for the majority of a full charge, while the FLA battery packs can only accept full charge current for approximately the first hour of a full charge," the report says. "After the first hour, or in the case of an opportunity charge, the charge current for the FLA battery drops in order to maintain a charge voltage limitation."

The report also pointed out that the lithium batteries required less time for charging, resulting in less charge events. The lithium batteries were able to be charged more rapidly, with essentially an equal capacity added during the charge.

As for on-the-ramp performance, the evaluation showed the lithium batteries had a more consistent discharge to charge capacity efficiency at 85 percent and 86.7 percent, compared to the FLA batteries at 60.6 percent and 87.2 percent.

"When comparing the amount of time spent driving the baggage tractors versus charging," the report says, "there is a clear advantage to the lithium battery vehicles, with more time available for driving than required for charging. The FLA battery vehicles remained inefficient, with the vehicles undergoing more hours of charging than they could be driven due to the longer charges and



A cross-section of the NexSys battery from EnerSys.

battery equalization cycles required for the FLA batteries."

LEAD-ACID BATTERIES

We recently heard from Todd Allen, president of Allen Energy, about the new battery that a couple of airlines are currently testing on their equipment.

"We have a new battery out there called thin plate pure lead," he told us. "They have the benefits of lithium at a lead acid price."

While they may be new to the GSE market, the NexSys battery and charger system manufactured by EnerSys has been used in other industries.

According to product information, the batteries are constructed from 99 percent pure lead. The plates are extremely thin so more of them can fit into the battery. "More plates means more power," Allen adds.

Also, the batteries feature compressed Absorbed Glass Mat separator with high electrolyte absorption and stability to enhance cyclic capability. To resist vibration and eliminate internal sparking, cell connectors are casted to the plates and bonded.

Taken together, Allen says NexSys batteries offer optimized cycling performance and rapid recharging that conventional lead acid batteries—gel or flooded—cannot match. When

SUSTAINABILITY

used with an approved charger, the batteries offer the following benefits:

- High energy throughput—up to 180 percent of C per 24 hours with an opportunity charging regime.
- Long maintenance-free life cycle—up to 1,200 cycles at 60 percent DOD.
- Short recharge times—less than three hours at 60 percent DOD.
- More power in less space—the batteries typically take up a third less space than the equivalent lead calcium batteries.

PRECONDITIONED AIR

Meanwhile, outside a gate at Sarasota-Bradenton International Airport, a new more environmentally friendly PCA unit is being put to test with great results, according to Rick Hansen, president of the aptly named Verde GSE.

“We didn’t want to rush this product to market since we wanted to put it in a real-life environment and what we’ve heard from the airport has been very positive.”

Hansen recently started the company along with three other partners, including an engineer he had worked with during his career at Hobart Ground Power Systems.

“We set out to build a different type of business to build a different type of unit,” he adds. “We’ve incorporated the best of the

refrigerant technologies from the automotive, food equipment, and aerospace industries to build a simple, low cost, yet technologically advanced PCA system.

Hansen adds that the company’s design principles are centered on four green principles:

- Use of renewable materials,
- Energy efficient products,
- Quiet system operation, and
- Ultra-low charge units and safer refrigerants.

Hansen put a PCA unit running at 30-ton mode at Sarasota last summer and when we spoke to him, he was making plans to test a 60-ton unit at Orlando International Airport by September. “Having the units at these airports has helped us understand the customer requirements better,” Hansen says. “And we have used the feedback to make some nice improvements.”

At Sarasota, the Verde unit was matched up with a competitor’s unit and were instrumented by the airport to service an MD-80 aircraft.

“What they discovered is the competitor’s unit was pulling 85 amps, and our unit was pulling 55 amps,” he adds. “Our unit was 35 percent more energy efficient. In addition our unit had 100 feet of hose between the unit and the aircraft and the competitor’s unit 60 feet. So even though our unit had 40 more feet of hose, it was able to produce 10 degrees cooler air in the forward section of the aircraft and 6 degrees cooler air in the rear of the aircraft. We are very happy with these results.”

Accordingly, Hansen says the company will start actively marketing the PCA unit by October.

FUEL CELLS

Last June, Plug Power Inc. publicly demonstrated its Plug Power GSE fuel cell prototype this week, for the first time.

The demonstration involved a Charlotte cargo tractor, which pulled 40,000 pounds of heavy weight that was spread equally on four dollies. This demonstration took place at Plug Power’s



Verde GSE is currently testing its PCA unit at two airports in Florida.

premises and the audience included Charlotte America, FedEx Express (the GSE operator and project partner) along with the executives of Plug Power and also the representatives from the Department of Energy.

The company’s newly engineered and designed hydrogen fuel cell beta unit promises to be a zero-emission power source for GSE, including auxiliary power units, tractors and belt loaders.

Plug Power is trying to penetrate into the markets which are adjacent to the material handling business, where its GenDrive fuel cells have already proven their worth.

The company plans in the next phase of the project to deliver 15 Plug Power GSE fuel cells to FedEx at Memphis Airport by the fourth quarter of 2014.

In conjunction with the GSE fuel cells, Plug Power will provide a GenFuel hydrogen infrastructure that includes:

- Scalable hydrogen supply that can ramp up from fueling 15 demo units to fueling an entire fleet of commercial units, without additional investment.
- Low cost liquid hydrogen that offers accelerated fuel savings as the number of GSE tugs in operation increases

As you can see airports are not the only ones striving to green their operations. Check out what’s going on in the ground handling operations at your airport. These operations are going green too!



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MIAMI INTERNATIONAL COVERS AIRPORT WITH BEACONS

Miami International Airport recently became the first airport in the world to have a complete and open deployment of beacons. The beacons cover entrances, check-in, gates, baggage claim and valet parking zones throughout the airport. Each beacon broadcasts its identifier in the zone and this can be used by airlines, retailers and other partners' apps to trigger useful content to passengers or staff. Miami Airport's beacon zones are in operation throughout the terminals, skytrain and car parks to allow wayfinding to be offered on passenger's phones. SITA Lab, the research team at SITA, has already tested the beacons with mapping technology which has proved hugely successful.



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"Aviation and aerospace engineering sectors have been the target of cyber espionage with nexus to China as well as Iran."

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240

The average number of days it takes to discover a cyber attack.

"Mainstream cyber security measures are often focused on the traditional elements of an IT network and will therefore fall short of fully understanding the cyber security needs of an airport. In my view, a more holistic approach is needed that encompasses wider elements of the airport's infrastructure."

JOHN MCCARTHY, CYBER RESEARCH
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PRESIDENT OBAMA, 2013 STATE OF THE UNION ADDRESS,
WHEN HE ANNOUNCED HIS CYBER SECURITY ORDER



"We are seeing unprecedented growth in cyber incidents and that trend will only increase as we move more of our personal and professional lives online."

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