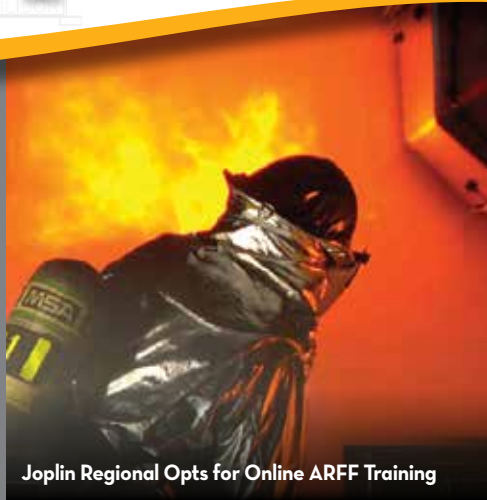


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Objectivity

Imagine reading a feature story in *The New York Times* and discovering it was written by the staff of Hillary Clinton or Donald Trump. How objective do you think the article would be? And what would happen to the newspaper's reputation and readership if it became known that feature articles were written by people making news, not covering it? Let's bring it closer to home. Do you think that anyone in airport management would be allowed to write feature stories for local or metro newspapers? Hardly!

Now I'm not talking op/ed pieces like this column or our Industry Insider. They are a different animal and serve a different purpose. I'm talking about feature articles.

It's no accident that newspapers don't let newsmakers write the news. There are issues of research, time, credibility, balance and ultimately publication readership. The same should be said for credible industry and business-to-business publications. Articles need the objectivity, balance and research provided by professional writers, not industry suppliers or consultants.

Airport Improvement has always subscribed to the journalistic notion that we absolutely need input from airport executives, department personnel, consultants, suppliers, government officials and others. But this need is in the form of information and interviews, not writing. We need their information and expertise to create well-balanced and informative articles. Our team of more than a dozen writers is trained to write. They provide the time, research, interviews and wordsmithing talent to provide objective and relevant stories. Self-promotion is simply not an issue.

Do we want the industry's input about ideas and information for stories? You bet! We solicit them all day long. But please, the left seat on *this* plane is saved for objective staff writers.

Cheers,
Paul



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Dallas Love Field Prepares for the Future with Timely Pavement Management Program

BY ROBERT NORDSTROM

 In early 2014, the city of Dallas and Dallas Love Field (DAL) were in a unique and ultimately timely position from operational and funding perspectives alike. The expiration of the Wright Amendment in October 2014 allowed air carriers to modify flight routes out of DAL, thereby increasing air traffic and changing the aircraft types needed to handle traffic. In addition, the upcoming 2017 expiration of the letter of intent associated with the long-running Love Field Modernization Program will make federal discretionary and entitlement dollars available for airfield-related projects that had been deferred because of the modernization program.

With these upcoming changes, city officials agreed that DAL was due to update its pavement management program. (The last time that occurred was

in 2008.) In April 2014, six months before the Wright Amendment expired, Kimley-Horn and Associates initiated a thorough evaluation of DAL's airfield pavements to provide background data for a reasonable maintenance and rehabilitation schedule. The firm was also tasked with developing a 10-year capital improvement program that the city of Dallas could trust for budgeting project costs and was phased to minimize impact on airport operations.



JENNIFER NICEWANDER

Jennifer Nicewander, senior engineer for the city's Public Works Department, reflects on the timeliness of the project elements: "The year we were scheduled to do a pavement evaluation was the year before

the terminal would open with its additional gates and the Wright Amendment would expire. We were able to learn the condition of our pavements right before we would have a huge increase in air traffic."

The pavement evaluation confirmed that quite a bit of work was needed, she adds.



CRAIG WEST

DAL was in a unique position, explains Kimley-Horn Project Manager Craig West. Airfield projects suffered because discretionary funding was tied up with the terminal Modernization Program. With the upcoming increase in traffic and heavier aircraft, pavements would be impacted.



“Our goal was to position Love Field with a bulletproof CIP (capital improvement program)—a plan that the FAA could value and trust and would position the city and airport to receive funding for large-scale airfield improvement projects once the letter of intent expired,” West elaborates.

Multi-Pronged Strategy

The airport took a comprehensive approach to updating its pavement management program, including visual, structural and detailed geotechnical evaluations. The scope of work included:

- reviewing as-built records from 1955 to the present for all areas of the airport;
- updating the existing 2008 pavement network definition plan, identifying branches, sections and sample unit locations to reflect current conditions;
- visual inspection of airside pavements;
- nondestructive testing and structural evaluation of airside pavements with a falling weight deflectometer;

- geotechnical investigation of entire airfield;
- updating existing PAVER™ database and customization information, including maintenance strategies, prioritization guidelines and unit cost data;
- economic analysis using constrained and unconstrained budget scenarios to develop a recommended maintenance and rehabilitation program for a 10-year capital improvement program;
- structural pavement evaluation to determine remaining life, pavement classification numbers and rehabilitation alternatives; and
- integration of functional and structural condition data into a realistic, prioritized capital improvement program that considered DAL's specific construction phasing and operational constraints.

Kimley-Horn performed a two-phase visual condition survey in May and July 2014 in concert with planned runway

FACTS&FIGURES

Project: Comprehensive Airfield Pavement Management Program

Location: Dallas Love Field

Timeline: April 2014-Dec 2014; additional reevaluation & report in March 2016

Cost: \$1.2 million

Funding: Airport Improvement Program (75%), Dept. of Aviation (25%)

Project Manager & Technical Elements: Kimley-Horn & Assoc.

Records Research & Pavement Condition Surveys: Parsons Brinckerhoff

Records Research, Pavement Condition Surveys, GIS Integration: IBARRA Consulting Engineers

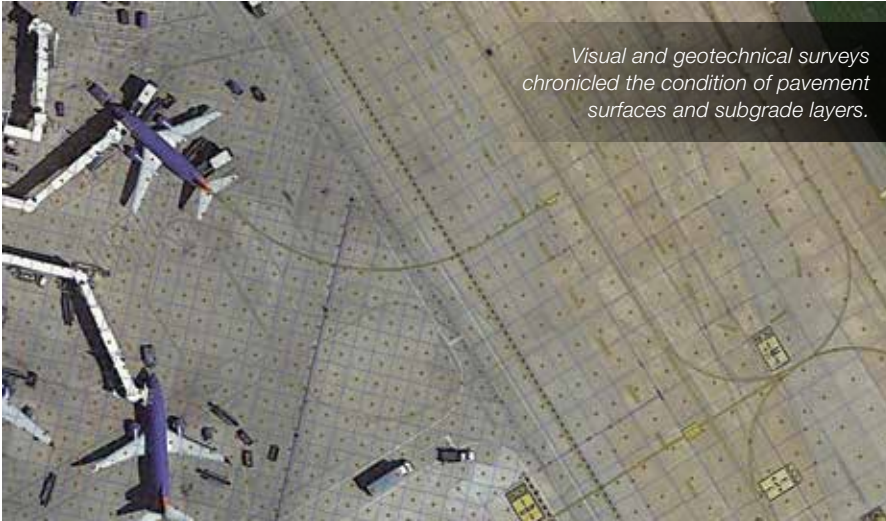
Nondestructive Pavement Testing & Geotechnical Investigations: HVJ Assoc.

Structural Pavement Evaluations: Pavement Technical Solutions

Quality Control: Roy D. McQueen Engineering Consultants

Automated Pavement Management System: PAVER™

Of Note: Timely pavement management program arms airport with capital improvement program to handle future airfield projects resulting from 2014 expiration of Wright Amendment & associated air traffic increases



Visual and geotechnical surveys chronicled the condition of pavement surfaces and subgrade layers.

closures. During the surveys, crews inspected nearly 15 million square feet of airfield pavement, including runways, taxiways, aprons, shoulders and blast pads. Visual condition data collected during the pavement condition index (PCI)

inspections were entered into the PAVER™ database, which in turn calculated the current PCI for each sample unit and section.

Using data based on the airport's historical PCI figures, the report predicted

future PCI values and pavement condition in five years (2019) and 10 years (2024) if DAL would choose not to perform any major airfield pavement rehabilitation.

HJV Associates conducted a geotechnical investigation to determine pavement composition and subgrade conditions. The company also provided a detailed review of existing geotechnical data and construction history data contained in the 2008 pavement management program. Crews retrieved 114 pavement cores and drilled 16 geotechnical borings.

Under the supervision of Pavement Technical Solutions, HJV performed nondestructive deflection testing during May and July 2014 on all airfield pavement sections to determine potential areas of structural deficiencies.

Variations notwithstanding, Kimley-Horn found that the majority of DAL's pavement

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sections had structural remaining lives greater than 10 years. Furthermore, the structural analysis results largely aligned with the functional analysis results—that is, most sections exhibiting poor functional remaining life also showed poor structural remaining life values. The report recommended these sections be targeted for reconstruction in the capital improvement program.

Some pavement sections, however, were found to be performing well functionally in spite of poor theoretical structural remaining life values. Taking into consideration the unique nature of many pavement sections at DAL, the team recommended that these sections be monitored closely for further deterioration and crews address signs of structural distress as they appear.

DAL selected a 10-year planning period for maintenance and rehabilitation/reconstruction budgets. Kimley-Horn

evaluated various funding scenarios with airport staff, including no funding, unlimited funding and necessary dollars per year over a 10-year period to eliminate major maintenance and rehabilitation backlog. After reviewing a variety of viable program scenarios, the team recommended a \$15 million annual budget as the most cost-effective maintenance and rehabilitation plan for pavement-related improvements. Overall project cost estimates for the recommended 10-year program exceeded \$250 million.

Kimley-Horn completed the pavement management program and provided its report in late 2014, just after the Wright Amendment expired in October. That meant that the airport had a good picture of pavement conditions just as its air traffic began to increase.

Fourteen months later, the city of Dallas hired Kimley-Horn to conduct an additional evaluation to determine how pavements

were holding up amidst the approximately 80% increase in air traffic over that time period.

“The pavements had deteriorated at a rate that we did not expect,” Nicewander reports. “Having Kimley-Horn back that second time solidified what we were going to have to accomplish over the next five to 10 years. We have a lot of work to do.”

Based on the consultant’s second evaluation, the airport is currently reevaluating its pavement work priorities, notes Robin Dickens, senior program manager for the Department of Aviation. “It has provided us with the information we need to reprioritize airfield projects going forward. Taken together with the other assessments and the airport master plan,



ROBIN DICKENS

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this assessment is a valuable decision-making tool for the airport. It allows us to coordinate upcoming work in a way that makes efficient use of available funding. We can use these findings to lay out a comprehensive program that supports the airport's goals and master plan objectives."

Integrated Approach

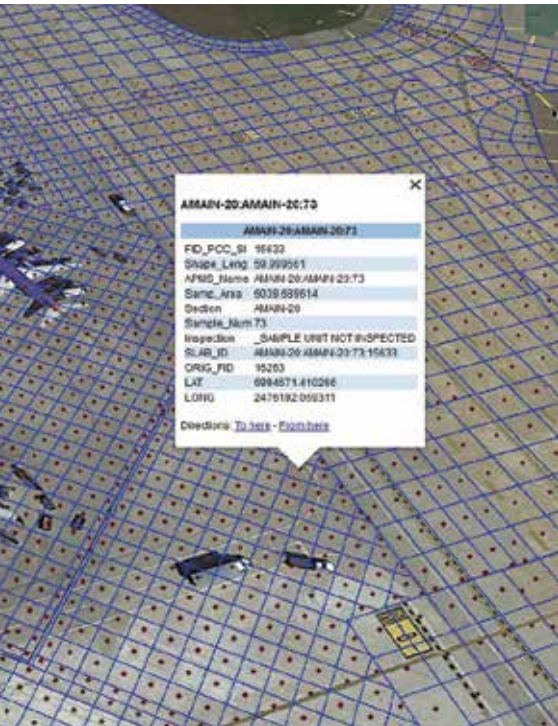
While a good pavement management program cannot replace good engineering judgment, it can be an excellent tool to assist airport officials in their decision-making process because the information it provides can be used to prioritize projects and to support funding requests, explains West.

Love Field was unique, he adds, because it performed several other studies concurrently with its pavement management program analysis: an airfield electrical needs study, airport master plan study and airport master drainage study. City officials then instructed Kimley-Horn to integrate the recommendations of these various studies into an overall capital improvement program for the airport that considered all critical project elements.

Edwin Tamang, project engineer for Kimley-Horn, details the value of DAL's method: "This comprehensive approach



EDWIN TAMANG



really pays dividends because it allows city and airport officials to position the airport in context and with full technical justifications for grant opportunities in the future. A lot of airports wait until they have to fix something before they plan for it. That kind of reactive approach doesn't always work out well. Dallas Love Field understood that taking a proactive approach was better because it lines them up for funding well in advance. Drawing from all the evaluations of the different studies and making comprehensive recommendations and decisions based on this holistic picture and not simply pavement condition would serve them better moving forward."

Nicewander concurs, adding the comprehensive and proactive approach gives the city and airport a better and more realistic view of the total cost of a pavement project when costs of ancillary projects are considered.

Tamang explains that many airports struggle with initiating projects in an efficient and cost-effective way. It's often difficult for operations and maintenance staff to identify exactly what needs to be done and efficiently integrate projects into work orders, he adds.

With this in mind, Kimley-Horn developed a geographic information system (GIS)-based product that can be integrated with a work-order system.

"Now, airport staff can easily identify a problem area on the airfield using GIS technology on their tablet or smart phone," Tamang adds of the still-to-be-procured system. "If you're out on the airfield in a sea of pavement and you see a problem area, it's tough to nail the location down for others to find it. You can't put a cone or flag out there. With GIS, a problem area can be identified and a work order initiated. It streamlines the process and saves time and money."

Nicewander highlights the executive summary of the pavement management program as particularly valuable. "That's been an extremely helpful tool," she reflects. "It allows us to explain to people who do not necessarily have a technical background at airports why we have to reconstruct a taxiway without bogging them down with technical details." ✈️

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Washington Dulles Tames 2016 Snowzilla With L

FACTS & FIGURES

Project: Reopening After Historic Snowfall

Location: Washington Dulles Int'l Airport

Most Recent Blizzard: Winter Storm Jonas, also known as "Snowzilla"

Timing: Jan. 22 – 24, 2016

Snowfall: 29.3 inches

Snow Removed From Airfield: 109 million cubic ft.

Total Snow Removed: 124 million cubic ft. (includes parking lots, roadways, etc.)

Blizzard Staff

Ops	25	Contractors	72
Maintenance	285	Toll Road	30
Financer	9	Total	421

Labor Cost for Full Recall: \$25,000/hour

Equipment for Runway Teams

18 multifunction vehicles	4 deicer trucks
4 dedicated plows	12 push loaders
3 dedicated brooms	2 material spreaders
9 snow blowers	

Equipment Mfrs: Airport Technologies Mauler/MB Industries Broom; John Deere; Kueper; Mack Trucks; Oshkosh; Rolba; Trecan; Wausau

Contractors: Atlantic Contracting & Materials; Aero Snow (Top Dog Services will replace Aero Snow this winter)

Fuel Consumed: 45,000 gallons of diesel fuel; 4,000 gallons of gasoline



Last winter was particularly rough on Washington, D.C., and its airports. Winter Storm Jonas, or "Snowzilla" as local media dubbed it, dumped 29.3 inches of snow on Washington Dulles International Airport (IAD)—the largest amount from an individual storm in the airport's 70-plus-year history. The storm began midday on Friday, Jan. 22, and raged for 36 grueling hours.

IAD stood ready, however, thanks to lessons it learned during previous blizzards. Snowzilla also blew in and out exactly as forecast.



STEVE SETTLE

The National Oceanic and Atmospheric Administration "was right on the money, down to the time it would come," recalls Steve Settle, the manager of Structures and Grounds at IAD. Meteorologix, a subscription service that provides the airport with custom weather updates twice daily, sounded the warning

bell as early as Monday, predicting at least a foot of snow for the weekend.

With five days notice, the airport began methodically implementing its full recall plan, which mobilizes a workforce of more than 400 employees and outside contractors to attack snow and ice around-the-clock. Executing the plan costs IAD \$25,000 per hour in labor alone.



CHRISTOPHER U. BROWNE

Christopher U. Browne. "Ensuring adequate crew rest, maintaining the equipment, and coordinating the resupply of critical snow supplies are all key elements in restoring the airport to full service following a large snow storm. We are always anxious to meet our passengers' travel needs, but it's critical that we do so safely and efficiently."

"A storm as significant and prolonged as Snowzilla demands that the staff and management team pace themselves for the long haul," notes Airport Manager

Lessons Learned From 2010 Snowmageddon

BY THOMAS J. SMITH

In addition to clearing the airfield and airport parking lots, IAD crew are also responsible for removing snow on the Dulles Toll Road and Dulles Access Road—112 lane miles of roadway between the Washington Beltway and the airport. (In addition to operating IAD and Reagan National Airport, the Metropolitan Washington Airports Authority also manages key roadways associated with IAD.)

During Winter Storm Jonas, IAD's airfield team removed 109 million cubic feet of snow—the equivalent of clearing a 12-inch snowfall off one driving lane from IAD to Breckenridge, CO. With parking lots, roadways and other landside pavement included, the combined snow teams cleared more than 124 million cubic feet of snow.

On Friday, airfield crews began pre-treating runways shortly after 8 a.m. The full recall went in to effect at 10 a.m., and snow began falling at 12:29 p.m. Airlines continued to fly in and out of IAD on Friday; however, the last departure occurred at 12:50 a.m. on Saturday—a FedEx cargo plane.



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A groomer rented from a nearby ski resort proved so helpful during previous blizzards, the airport hopes to purchase its own.

With snow falling at nearly 2 inches per hour, the Operations Department declared whiteout conditions and suspended work crews at 12:50 p.m. Saturday. Crews returned to the runway at 7 p.m. Saturday, and, mercifully, the snow stopped falling about two hours later.

The airport ended its full recall on Tuesday and pulled its last runway

cleanup crew at 6 that evening.

“The entire crew performed magnificently,” Browne notes. “The Dulles Airport Council of Airline Managers made special note of their actions, and we received an abundance of favorable and complimentary tweets, emails and comments. As is often the case after a large storm like Snowzilla, Dulles

International Airport was ‘open and back to business’ well before the region’s other businesses and transportation facilities.”

Although the January blizzard delivered IAD’s largest individual snowfall, the airport was also hit with 54 inches during back-to-back blizzards in 2010—a period known as “Snowmageddon.” After recovering from that experience, IAD re-wrote its snow removal manual and applied those lessons when battling Snowzilla.

Lesson #1: Don’t Open Too Soon

When Dulles reopened on Monday, Jan. 25, at 6:09 a.m., the entire airport was ready to accept an incoming Copa flight from Panama City in Central America. “When we are open, we are truly open—not just the runways operating,” Settle specifies.

“This is a lesson we learned the last time. When we reopened [in 2010] at 6

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a.m., there were literally two planes on the horizon. The first was the same Copa flight from Panama and the second one was carrying the Washington Capitals [the area's pro hockey team]. The parking lots were not cleared. The roads were not cleared. It does not do any good to open up a runway just to bring in people if there is nowhere to put them," he reflects.

This time, however, was different. "It would have been great to open on Sunday," Settle acknowledges. But the parking lots, roadways and access highways were not open. The crews took one additional six-hour shift to move more snow so the airport could be fully functional.

On Sunday morning, officials made the decision to reopen at 6 a.m. Monday. The deadline was not flexible because the first arriving flight would depart Panama City 13 hours before the now-published reopening. The carrier made the decision 17 hours prior to the scheduled landing that the flight would indeed take off as scheduled.

The 11,500-foot-long Runway 1R opened just 15 minutes before Copa 488 landed. On Tuesday, 11,500-foot-long Runway 1C opened at 7:39 a.m. and IAD's crosswind runway, 12-30, opened at 9:58 a.m.

Runway 1L was "allowed to go fallow," explains Settle. The airport chose not to send crews to clear it, allowing Mother Nature to do most of the work. Five days later, crews attacked the remaining snow.

Lesson #2: Use A Snowcat

IAD's seven instrument landing system (ILS) antennas present special maintenance challenges during winter storms. The remote equipment is difficult to access and clean, but the airport is restricted to visual flight operations without them.

During the Snowmageddon of 2010, IAD ground crews scrambled to rent a snow groomer, also known as a snowcat, from a local ski resort to clear the critical ILS antennas. In a frustrating twist, the airport was cleared and open but unable to accommodate instrument-aided flight operations until the ILS antennas were cleared. Airfield crews were stuck waiting for outside roads to open so the ski resort could deliver the rented snowcat.

Before the 2015-16 snow season began, IAD tried to arrange use of a snowcat on a stand-by basis through the airport's procurement process. But no operator was interested in the \$2,500 retainer that was offered. "No one wanted to commit a snow groomer because they were making money with it," explains Settle.

The Monday before the 2016 storm hit, Settle contacted Massanutten Ski Resort, three hours southwest of the airport, and successfully convinced its managers to lease the airport a snow groomer. A snowcat and driver arrived on Thursday night, before the snow started falling. Using GPS readings and a GPS-tagged map, an airport employee guided the snowcat driver around the airfield so the antennas could be cleaned.

On Saturday, shortly before the airfield reached whiteout conditions, crews used the snowcat to lead runway crews back to the ops facility. "In Snowmageddon, we walked out from the fire response gate to the edge of the taxiway to assist the team leader in finding the fire road entrance," Settle recalls.



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Mobilizing IAD's full winter storm workforce of 400+ airfield workers costs \$25,000 per hour in labor alone.

The ski resort's equipment and crew were also put to use clearing electrical vaults—a task they completed in 20 minutes. In contrast, Settle estimates that it would have taken a front-end loader four hours to travel the 1.5-mile gravel road to reach just one of the vaults.

Lesson #3: Better to Melt or Haul Snow Than Push It

After Snowmageddon, the airport authority purchased four snow melters each capable of melting 135 tons of snow in one hour. The new equipment was assigned to Atlantic Contracting & Materials, the contractor hired to clear the gate areas of concourses A and B. United Airlines, which has exclusive use of concourses C and D, hired Aero Snow, which uses nine snow melters.

When snowfall rates reach 6 inches in three hours, it is necessary to use snow melters “because we don't have time to catch up,” explains Settle.

IAD also implemented a new snow-hauling plan to clear the gates and aprons.

Atlantic Contracting used large quarry-size dump trucks with triple the capacity of normal dump trucks. Drivers used the extra-large vehicles to haul snow to the southern most taxiway, which has a wide shoulder and 300-foot deep grassy area. Operators dumped loads of snow as they drove along the taxiway, and two snow blowers followed behind and blew the snow into a pile. “This was a tremendous saver,” Settle reflects. “We cut time from 10 minutes per truck to two minutes. This is great when you only have so many trucks. We are going to write this into our next contract for snows greater than 8 inches.”

During Snowzilla, crews hauled more than 9,500 loads of snow from the concourse areas.

Lesson #1 for Next Time: Cross-Train

Of the 421 workers IAD dispatched during the historic 2016 blizzard, only 25 were full-time airport operations employees who knew how to run every piece of equipment. The others—from all walks of life around the airport or outside companies—knew how to run one or maybe two pieces of equipment.

“The plan this year is to have more cross-training,” says Settle. Eventually, he would like to have 40 to 50 employees trained on at least three pieces of equipment.

When in a snow mode, IAD operates in six-hour cycles, with half of the crews sleeping while the other half works. The airport converted former construction trailer offices into a sleep center, complete with showers, to improve conditions for workers during weather events. The new rest area can accommodate 110 crewmembers at a time.

The six-hours-on/six-hours-off work cycle suits IAD, because few of its storms extend beyond 24 hours.

Lesson #2 for Next Time: Buy a SnowCat

Given the airport's previous experiences trying to clear snow from its ILS antennas, Settle has requested funding for a small snowcat. Although the request has cleared the first of the airport's two-part procurement process, if funded, he doesn't expect a snowcat to be available until the 2017-18 snow season.

Settle considers the equipment a good investment, due to its versatility and the inherent restrictions associated with negotiating leases as storms approach.

Lesson #3 for the Next Time: Obtain Equipment to Clean Runway Lights

With 9,798 runway lighting fixtures and 451 airfield signs to clear, IAD crews spend a lot of time hand-cleaning snow from each unit to prevent damage. During Snowzilla, workers cleaned each light three times over the course of the blizzard. “This is a very tedious process for the electricians,” Settle remarks.

Ideally, he would like to facilitate the work with specialized broom heads such as the ones used at Minneapolis-Saint Paul International.

“I get jealous whenever I visit their operation, but they battle snow 40 to 50 times a year,” reflects Settle. “I tell my crews that just like you ‘can't build a church for Easter Sunday,’ you equip an airport for a regular snowfall.” ✈️

Joplin Regional Opts for Online ARFF Training

BY MIKE SCHWANZ

Meeting annual training requirements for aircraft rescue and firefighting (ARFF) personnel can be particularly challenging at smaller airports with small staffs, where firefighters often perform airfield maintenance in addition to their primary ARFF and operational duties.

Joplin Regional Airport (JLN) is making things easier for itself by using a training program that allows ARFF personnel to complete the vast majority of their training online.



PETER KAUFMANN

“This program has really saved us some time and money,” says JLN Operations Supervisor Peter Kaufmann. “We have a maintenance staff of eight people, including myself, who are ARFF-trained and certified. But we also have a ton of daily tasks taking care of the airfield, including snow removal, grass cutting, taxiway lights and other general maintenance jobs. Basically, we have ultimate responsibility for keeping our airport up and running.”

Previously, it was hard for the small Missouri airport to establish an ARFF training curriculum that included evolving updates. “Scheduling training was difficult with a small staff, who were always busy with other day-to-day assignments that were of a higher priority,” Kaufmann explains.

Things got easier, however, when JLN became an early adopter of an online program created by SSI, a software training company based in Arizona, and the Dallas/Fort Worth International Airport Fire Training Research Center (DFW FTRC).

FACTS&FIGURES

Project: Online ARFF Training

Location: Joplin (MO) Regional Airport

2015 Flight Operations: 27,000

Fire Equipment: Oshkosh P-19; Rosenbauer Airwolf (both owned by airport)

Online Course Supplier: SSI

Content Development: Dallas/Fort Worth Int'l Airport Fire Training Research Center

Course Modules: 11

Approx. Time Required/Module: 1 hour

Cost: \$395/person; group discounts available

Computer Hardware Needed: Current desktop, laptop or tablet

Key Benefits: Saves time for students & administrators; eases recordkeeping; FAA-approved; greater flexibility for trainees





Having a concrete, step-by-step program has made ARFF training a much more efficient process, reports Kaufmann. "With this SSI program, all eight people take the same course. I simply give the trainees a user name and password to the arffrecurrent.com website, and they can use their own computer or laptop to take each course when their schedule allows," he explains.



SCOTT SIMPSON

Content for the course was developed by ARFF training experts from within the airport industry to ensure that it is accurate and up-to-date, notes Scott Simpson, director of client services for SSI. Based on National Fire Protection Association standards, the program meets 14 CFR 139.319 ARFF training requirements.

"Throughout the development stage, we also worked very closely with the FAA, to ensure each course met its standards," adds Simpson. "With the support of the Fire Training Research Center, we have provided access to the FAA for review and are hopeful for their input."

The program uses quizzes throughout the training process to prepare students for an individual online test for 11 modules:

- ARFF Safety
- ARFF Emergency Communications
- ARFF Adapting Structural Equipment
- ARFF Tactical Operations
- ARFF Hoses & Nozzles
- ARFF Extinguishing Agents
- ARFF Aircraft Familiarization
- ARFF Aircraft Evacuation Assistance
- Aircraft Cargo Hazards
- Airport Familiarization
- Airport Emergency Plan

The final requirement for all ARFF trainees is an annual live-fire test, which can occur at an airfield or training facility such as DFW's, which SSI wholly recommends. JLN trainees usually complete their live-burn training and testing at Springfield-Branson National Airport, also in Missouri.

"It is only 70 miles east of here, and they have a mobile aircraft fire-training trailer (MAFT) they set up there every May that we use," Kaufmann says.

"The MAFT is capable of producing a wide range of realistic training scenarios, including a fully engulfed aircraft, a forcible entry situation or a 1,300-square-foot fuel spill burn area," he continues. "It incorporates a 50-foot aircraft simulator fuselage to challenge the aircraft rescue firefighters."

If trainees have scheduling conflicts in May, Kaufmann considers DFW FTTC



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a good alternative, because American Airlines has two daily flights between JLN and DFW.

With live training in May, Kaufmann schedules online training for September through May to minimize conflicts with the numerous outdoor projects the airport's ARFF personnel complete during summer.

Insider Info

DFW FTRC, the organization that developed content for the new online training program, is widely recognized as one of the leading facilities in the world for training airport-based firefighters. The airport maintains a staff of 220 full-time firefighters based at six different stations to cover its airfield and 28 square miles of structures. "We manage all structures, as well as any aircraft's first-response needs," states Randal Rhodes, assistant fire



RANDAL RHODES



Online training modules include aircraft and airport familiarization.

chief in the Career Development Division. A 23-year veteran at DFW, Rhodes is in charge of recruiting and developing the airport's firefighting team.

"We have five full-time certified instructors for training, plus six or seven people on shifts who help with classroom work," Rhodes says. DFW's FTRC facility is at the southwest corner of the airport, next to one of its six fire stations.

"We offer 20 different courses, and [train] 2,500 to 3,000 students a year, from 44 different countries," Rhodes reports.

Training is offered for a wide variety of fire and rescue situations, in passenger and cargo areas of aircraft as well as for airport buildings. An out-of-service Airbus 380 is used for training associated with large fuel spills.

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ARFF personnel at Joplin Regional report that SSI's online training program is simple to use.

"We started developing online training modules about four years ago. We thought SSI would be a good partner for us, since they had expertise in multimedia online presentations. We knew we had the expertise to provide all the content and script development," Rhodes says.

When SSI filmed footage for its new online ARFF course, DFW firefighters and a few local students served as actors to portray firefighters and civilians alike.

According to Rhodes, it took eight months to create the course's 11 modules. "We reviewed all of the storyboards," he relates. "I was the project manager, and some of our captains in the field helped out. We held a weekly conference call with SSI as we put this together."

"Fortunately, SSI already had a good relationship with the FAA," adds Rhodes. "When updated regulatory requirements came out from the FAA, we knew what we had to do. SSI did a lot of the background work for us in this area."

He describes the process of creating content for the modules as painstaking and time-consuming, but the production process as smooth and relatively painless. "Once we completed the script writing and storyboards, SSI personnel did all the videotaping in about five days," he recalls.

The current version of the online program is up-to-date through this fall, but Simpson and Rhodes expect they will eventually have to update and modify it. "If one of us learns about regulatory changes, we will act to modify and upgrade the modules," Rhodes says. "We expect to have a decent amount of time to make any changes in the content, if necessary. There is always a public comment period before the FAA acts."

The latest upgrades to the SSI online courses were completed this summer. "Our software system is somewhat unique, in that we use HTML5 to produce the online courses instead of [Adobe] Flash," says Simpson. "We just completed doing this in summer 2016. All modules are now available with videos in high-definition. The HTML5 modules are more mobile, and can be used not only



After trainees pass online quizzes, they undergo live drills at an airfield or training center.

on a desktop, but on a laptop or tablet. With our new system, all courses are viewable full-screen, all in HD and with customized images and graphics for each topic."

Online Pioneers

According to SSI, four locations are using its online training program in addition to JLN: San Antonio International Airport, Bellingham (WA) International Airport, Freidman Memorial Airport in Sun Valley, ID, and DFW FTRC. "We are in active discussions with several other airports, and expect to add a few more this fall," Simpson adds.

The program costs \$395 per person, with discounts for groups and customized services offered at extra costs. "For most clients, the training administrator will go over the whole installation with us on a webinar. It is quite simple," says Simpson. "For our larger clients, we will go on-site and work with the leadership team there."

Serving as the ARFF training administrator at JLN has been seamless for Kaufmann. "I am fairly computer-savvy, and setting this up for my staff was pretty easy," he notes. "I think I spent one hour training with SSI, and that was all I needed. I love that I don't have to call SSI or the DFW people. I can do all of this myself."

On a similar note, his ARFF personnel consider the program simple to use. "My guys had very few problems completing the 11 courses," Kaufmann reports. "It was easy to get each of them up and running, and then they were on their own."

The online program also helps JLN keep accurate records of employees' ARFF training—an FAA requirement that proves to be a hassle for many airports. "Our program does all recordkeeping automatically," says Simpson. "This is especially useful for airports that want to train not only [their own] firefighters, but those from other local municipalities as well.

Overall, Kaufmann is very pleased with JLN's new online training program. "It centralizes and standardizes everything, and saves everyone a lot of time," he summarizes. "For a small airport such as ours, that is a big deal." ✈️



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DFW

Alaska Tries New Method for Repairing Runway Lights

BY MIKE SCHWANZ



Nome Airport (pictured) and other Alaskan airfields provide critical links for area residents.



FACTS & FIGURES

Project: Maintaining Airfield Lights

Location: Alaska

Northern Region Airports: 67

Territory Size: Larger than state of Texas

Airfield Buildings: 415

Associated Maintenance Staff: 47, including 3 electricians

Primary Task: Maintaining airfield lights

Regional Challenges: Ice buildup in light canisters; brutal weather for maintenance personnel; airfield vandalism; wildlife damage; varying efficiency of local contractors

New Maintenance Equipment: ThawHead & ThawRig

Vendor: Central Alaska Metalworks

Equipment Benefits: Reduced maintenance time (from 2 hours to 10-15 minutes); reduced cost for wait time by outside pilots who fly in maintenance crews

Airfield maintenance can be tough at any location, but few places in North America present more challenges than northern Alaska. Keeping runway and taxiway lights working at the remote airfields that dot the state can be extremely challenging, and workers who undertake the job often work in downright punishing conditions.



STEVEN MEIEROTTA

One of the state officials who supervises such operations is Steve Meierotto, regional buildings maintenance manager with the Alaska Department of Transportation and Public Facilities. He is in charge of 415 buildings in the state's Northern Region, which encompasses 67 rural airports.

"This is a huge territory to cover—it's larger than the state of Texas," Meierotto explains, noting that some villages are 650 miles from the department's base in Fairbanks.

"Our climate is brutal," he continues. "If it is colder than -20° F, we usually do not go out. That is also the limit for the leased aircraft we use to reach the remote airfields. Commercial flights, however, sometimes will fly at -30°F and colder."

With only three electricians on his 46-person staff, repairing lights is typically one of Meierotto's biggest challenges.

Even at the smallest and most remote airports in northern Alaska, regulators for airfield lighting are housed in electrical equipment buildings. Each field's lighting system is connected to a specific radio frequency, so approaching pilots can turn on runway and taxiway lights by clicking their microphones inside the cockpit.

Same Specs, Different Strategies

FAA specifications for runway lights in Alaska are no different from those used at other airports in the United States and Canada. Each light is mounted and sealed atop a

14-inch-diameter, 2-foot-deep steel canister. When canisters in Alaska are damaged, however, they quickly fill up with snow, water and gravel. Soon, the transformer and airport circuit wires become encased in ice. Amid Alaska's characteristically cold temperatures, ice is an extremely tough material. To make repairs, maintenance personnel often chip away at icy globs with hammers, chisels and screwdrivers. Clearing ice from canisters can take a long time—up to two hours per light in subzero temperatures—and crews often inadvertently damage transformers and wiring during the rough and inexact process.

Although the canisters that hold airfield lights are sturdy, the area's harsh climate often damages them, notes Meierotto. "At most of our airports, the ground is saturated and subject to frost cycles of freezing and thawing," he explains. "The canisters are open on the bottom. If there is a big rain, water comes up from the bottom, and the canisters can freeze and pop like frozen soda cans. This jacks up the can, and can tear up the electrical connections and break the circuit, taking out all the airport lights."

Canisters that pop up because of frozen water also are much more likely to be hit by snowplows, he adds.

At most North American airports, runway and taxiway lights are flush-mounted even with the ground. In northern Alaska, though, they reside 2 feet above runway and taxiway surfaces. "All of ours are stalk-mounted, with breakaway capability for safety," specifies Meierotto. "If the light breaks off, then a replacement can be installed simply. The maintenance guy only has to unbolt the top of the can."

Even with a full-time pilot on staff, weather and a limited number of electricians make it difficult to reach every airport quickly. Meierotto relies on a local contractor based at each airfield to perform daily runway inspections.



TYLER CONNELL

Tyler Connell, who is based in the state's Fairbanks office with Meierotto, also works closely with local contractors. Only two of the 20 airfields Connell manages have paved runways. The rest are gravel—often 4,000 feet long and 100 feet wide, with 20 lights on each side. Taxiways have three to four lights on each side. (By FAA regulations, edge lights cannot be more than 200 feet apart.)

"From October to April, the local contractor checks lights every day; it is part of their contract," Connell explains. The state stocks each airport with supplies such as bulbs, stalks, lenses, frangible coupling, etc. Local operators make simple repairs, such as changing bulbs. "There are up to 20 pieces for each light," notes Connell.

When lights need to be fixed, he and his crews have learned the hard way that chipping away ice inside canisters is often not worth the effort. "You are more likely to wreck the transformer," he comments. "In the past, we have set up fishing shacks over a light, with space heaters. That helps warm the workers, but it doesn't work so well to thaw out the can."

Often, Connell and his fellow operators have to stay overnight at remote airports. "We have contingency shelters at some of



The cans that house runway lights at Kaltag Airport on the Yukon River take a lot of abuse from weather and snowplows.

the airports, with heat, electricity and a microwave. There aren't any hotels," he says. At airfields without contingency shelters, crews sleep in the snow removal equipment building or electrical equipment building—structures available at all state-managed airfields in Alaska.

"In some situations, when our workers get off a plane and have a long day ahead of them, the plane will just take off, and come back later to retrieve them," says Meierotto. "Other times, the pilot will just wait until they are finished. Once they deplane, the operators will often pack a sled with gear, and tow it up and down the runway trying to locate the cause of the lighting failure. It is pretty wicked duty. If it is way below zero, they may be able to spend only a short time out on the runway before they have to go into one of the heated buildings just to warm up."

According to Connell, airfield lights at Alaskan airports are more apt to get hit by snowplows than to burn out. Other serious problems occur when ground shifts, due to expansion and contraction of the permafrost. Sometimes, shifting ground severs the main lighting circuit serving an entire airport, and all the lights go dark—an obviously high-priority problem.

"If there are more than four in a row burned out, we have to shut down the airport. If too many lights are out, the regulator won't work, and all the lights go dark," Connell says.

Local contractors are expected to replace bulbs and complete relatively simple maintenance. But for more complicated electrical work, someone from Meierotto's staff flies in to perform the work. "We do not want the local guys to do complicated electrical work, for their personal safety," he explains, noting that a main lighting circuit contains up to 2,000 volts.

When a local contractor reports that lights are out and can't be repaired simply, the state dispatches one of its maintenance employees to begin the painstaking task of removing ice and gravel from the can before completing electrical repairs.



The melting and freezing of permafrost wreaks havoc with airfield lighting. Here, it completely severed a main conduit pipe.

New Equipment Solves Cold-Weather Maintenance Problems

When airport lights fail in Alaska and other cold-weather locales, gaining access to the lighting base canisters is extremely difficult, because they are often filled with ice and frozen gravel. With the transformer and airport circuit wires encased in ice, repairs are extremely difficult. Chipping out the ice is a lengthy, arduous task, often taking up to two hours per canister. And more often than not, the chipping process damages the very components needing repair.



CAMERON GACKSTETTER

Two years ago, Steve Meierotto and Tom Williams from the Alaska Department of Transportation and Public Facilities—Maintenance & Operations Division (Northern Region), urged a local mechanic and inventor to develop a device that could quickly thaw ice in airfield light canisters. Fairbanks resident Cameron Gackstetter rose to the challenge and built them a “better mousetrap” to make light maintenance more efficient.

Shortly after meeting with the two state officials, Gackstetter designed, built and tested a prototype of the ThawHead, a portable system that uses a two-stage process to thaw ice inside lighting canisters and allow crews to remove the meltwater and debris quickly and efficiently. Because the equipment is relatively

light (less than 40 pounds) and compact (40 inches tall, 11 inches in diameter), it is especially practical for Alaska’s remote airports. In addition, the system uses hot water without any added chemicals, so it is considered to be environmentally friendly.

Field personnel connect the ThawHead to a standard pressure washer with a high-pressure water supply hose and position the unit over the container or work area to be thawed. The equipment directs targeted jets of high-pressure hot water through nozzles in the base of the apparatus to break up frozen material. Adjustable alignment pins on the base of the head allow the unit to accommodate various-sized canister openings. To remove the water and debris, operators move the base of the ThawHead to the side and use the evacuation wand to suction out the melted slurry. The process typically takes 10 to 15 minutes (vs. two hours to chip away ice with a pick and hammer).

After producing the ThawHead, Gackstetter went to work designing a trailer to support and transport his new product. The result, dubbed the ThawRig, is an insulated trailer that contains a pressure-washer, generator, water pump, electric heater, battery charger, polyethylene water tank, antifreeze storage tank and room for the ThawHead apparatus. The self-contained wagon generates its own heat and electricity, and is built to withstand

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high winds and temperatures down to -20°F, with features to minimize frozen water lines, and fuel capacity to facilitate four hours of operation.

Gackstetter specifically designed the ThawRig to be towed by snowmobiles and all-terrain vehicles, and the unit fits neatly inside the small cargo planes that are the lifeline of northern Alaska.

“If you have road access, you do not need the rig,” he notes. “The head will work with any high-pressure washer. For example, if you are in Bemidji, MN, and have road service to the airport, you can just put the ThawHead in a pickup truck, and drive right to the lights on the runway needing work, and be done in 30 minutes or so.”

Gackstetter and his wife, Shannon, formed their own corporation, Central Alaska Metalworks, and have filed for product patents in the United States and Canada.

So far, the company has sold two complete units (ThawHead and ThawRig) to the state of Alaska. Five more Thawheads are built and ready for market, with four more in production. Gackstetter hopes to sell them to airports and military bases in northern countries around the world.

ThawHead units cost \$12,000 each, and individual ThawRigs cost \$42,000.



The support trailer is designed for towing by snowmobiles and all-terrain vehicles.



Left: An evacuation wand clears ice, melting water and other extra materials from the can. Right: Close-up of partially completed clearing process.

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Previously, crews used a rotor hammer with a custom-made bit and scraped ice out by hand to reach wiring in need of repair. “In the past, we have tried anything you can imagine to repair lights,” Meierotto recalls.

New Ice Tool

Fortunately, the nastiest part of performing electrical repairs at Alaskan airfields may soon be a thing of the past. A new portable system allows crews to thaw ice inside lighting canisters and remove the meltwater and accumulated debris to expose the area or container needing repair work. (See sidebar on Page 28 for more information.)

“These products have made a huge difference for us,” Meierotto reports, noting that the state purchased two sets of the new equipment. One is kept in Fairbanks, and the other is based in Nome.

“We can fly them to our airports and do repair work in a much shorter period of time,” he adds. At \$12,000 per thawing/extraction unit and \$42,000 for each support rig, Meierotto acknowledges that the products are expensive, but notes that the equipment will save the state money previously spent on outside pilots. “They are paid on an hourly basis, and we sometimes had

to pay them for several hours while they sat on the ground at an airport while our guys spent all day fixing lights,” he explains.

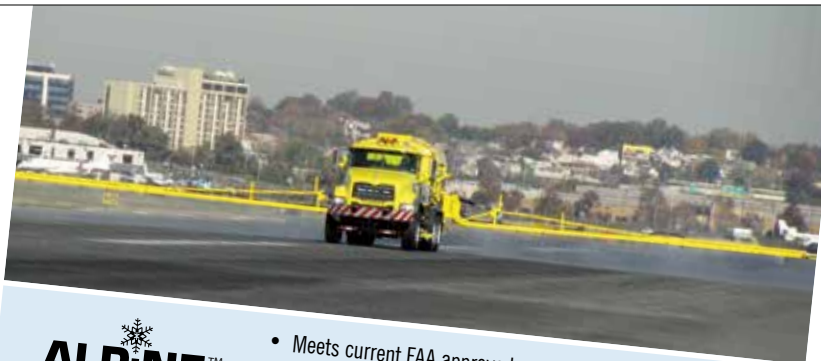
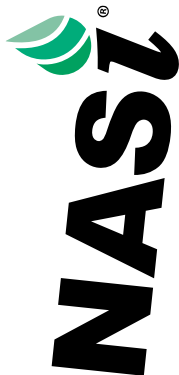
Connell agrees that the state’s new equipment makes airfield lighting repairs faster and easier. “We can land at an airfield and get all the lights fixed in a couple of hours, instead of two days,” he specifies. “The Sherpa cargo planes we use have ramps in the back, and you just drive the [customized trailer] from the plane to the ground, and get going.”

At Meierotto’s request, the system’s inventor gives demonstrations to operators in the maintenance department on how to use the equipment. “We want everybody on our staff to eventually know how to use it,” Meierotto says.

Ice Isn’t the Only Problem

Mother Nature isn’t the only local presence that complicates airfield maintenance in Alaska. “We sometimes have problems with vandalism at our airports,” Meierotto acknowledges. “Somebody apparently gets bored, and will run along the runway with a snowmobile or all-terrain vehicle and a baseball bat, breaking runway lights. When this happens, it overloads the lighting regulator and circuit, and all the lights will shut off.”

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Many of the state-owned snow removal equipment buildings have bullet holes in them, and airport beacons, runway lights and wind cones have also been used for target practice, he adds.

Sometimes, the local contractors hired for help with basic airfield maintenance prove to be part of the problem rather than the solution. "As with any group of people, some of these contractors are great, most are good, and some are unreliable," Meierotto explains. "If a village only has 30 residents, and someone wants to be our contractor, the primary qualification is low bid. That is it. In some cases, there is only one bidder."

In addition to changing bulbs and inspecting airfield lights, local contractors also use the department's equipment to clear snow from runways. "We've had cases where the new contractor's first experience in heavy equipment is immediately after they sign the contract and get the airport keys," relates Meierotto.

Wildlife damage is another common challenge at Alaskan airfields. At Shageluk Airport, wood bison were breaking off runway lights when using them as "belly rubs." Caribou and bears are repeat offenders elsewhere.

Keeping airfields open year-round in the state's vast, undeveloped areas is a responsibility Meierotto and his colleagues



Muskox and other wildlife are regular challenges at Alaskan airfields.

take seriously. "Approximately 80% of the villages do not have roads, and the local airfields are the only way to get supplies in," he explains. "If there is a medical emergency, it is imperative that planes be able to fly in to transport a local resident to a medical facility. Therefore, we have to keep the runway lights up and running." ✈️

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Industry Insiders Offer Online Forums for Airport Colleagues

BY VICTORIA SOUKUP

FACTS&FIGURES

Project: Online Forums

Primary Objective: Facilitate peer-to-peer communication about airport operation issues

Website Address: myairportoperations.com

Founder: Glen Barentine, interim airport director at Hot Springs (AR) Airport

Website Address: fieldmaintenanceforum.com

Founder: Jeff McNally, field maintenance supervisor at Gerald R. Ford Int'l Airport in Grand Rapids, MI

Sample Topics: Part 139 issues; general maintenance; training; FAA bulletins; security; wildlife management; snow removal; etc.

Once the exclusive domain of tech geeks and ultra-serious computer gamers, online forums are now mainstream information sources for many people. Airport operators and personnel, in fact, have multiple industry-specific sites at their disposal.

Wondering about the new drone reporting requirements? Confused about the fire ratings for aboveground fuel storage tanks? Check out myairportoperations.com.

Curious about the effects of various deicing products on aircraft and airfield infrastructure? Need advice on scheduling snowplow operators? Consult fieldmaintenanceforum.com.

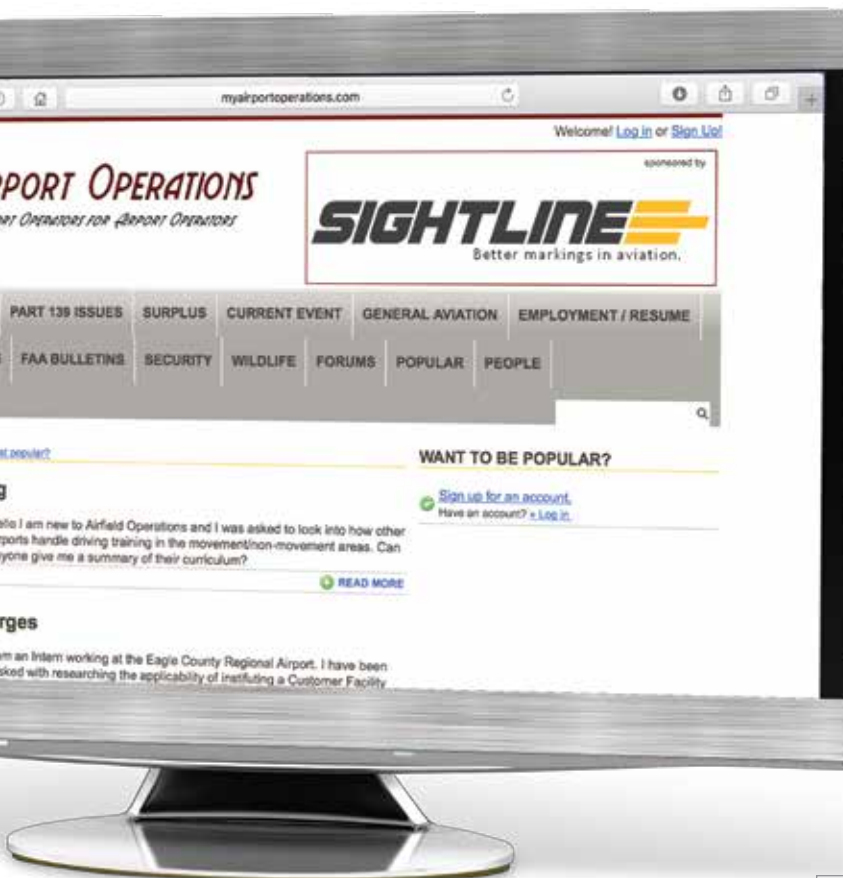
Both websites were developed by industry insiders to help save their peers time and money. Airport operators and personnel looking for information on a variety of topics can post questions online and then check back for answers as their schedules allow—

dramatically decreasing phone tag with multiple government agencies and other airport professionals. Neither website is associated with its founder's airport, and both developers/operators donate their personal time and resources to provide the online forums.



GLEN BARENTINE

Glen Barentine, airport director at Hot Springs Airport (HOT) in Arkansas, launched myairportoperations.com in 2009. "There were no other organizations that offered a place where I could just ask a question. And that industry gap needed to be filled," explains Barentine. "We needed a place where people could go and openly ask questions. So I utilized the resources I had with airports over the years and decided to start the website so we could all pool our knowledge."



McNally developed a list of potential users from business cards he had collected throughout the years (Millennials: Google “Rolodex” for historical context) and was surprised by how quickly people responded when he personally invited them to try the online forum. “It hit people square in the face that this was something different and something special,” he recalls.

Subpages on the websites include Part 139 issues, general maintenance, training and FAA bulletins about security, wildlife, snow removal and equipment. “A lot of the drop-down box ideas came from talking with staff and operations personnel,” McNally says. “We wanted to give people certain categories that we found the most problematic or informative.”

No Boundaries

While U.S. issues dominate both of the online forums, each website has an international following as well. Barentine recalls one member of *myairportoperations.com* asking for ideas about how to keep coyotes off airport property.

After spending about \$2,000 to build the website, Barentine announced its launch via Facebook and leveraged a variety of social media platforms to invite industry contacts to visit the site. “I used all the social media I could get into,” he recalls. “And when I attended any AAE or FAA training, I always handed out cards.”

Activity was slow at first but spiked just before the industry-wide deadline for submitting FAA-required emergency plans. Wanting to help other airport operators, Barentine posted the template he used to create HOT’s plan on *myairportoperations.com*. “We got hit after hit after hit from people asking to use the template,” he recalls. “Posting that template was a real good example of airports helping airports. The website really exploded after that.”

Field Intelligence

Like Barentine, Jeff McNally was similarly inspired to facilitate the exchange of ideas among airport insiders. As field maintenance supervisor at Gerald R. Ford International Airport (GRR) in Grand Rapids, MI, McNally was surprised how difficult it could be to find answers to some of his questions. So three years ago, he launched *fieldmaintenanceforum.com* with help from his wife, daughter and a co-worker’s son.



JEFF McNALLY

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- Was test performed immediately after runoff?

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A man in India, who had a similar problem with jackals, shared his success in using human hair clippings obtained from a local barbershop.

Part 139 issues generate the most posts on *myairportoperations.com*, followed by maintenance and training. "The broadness of the 139 regulations is what attracts a lot of people [to the website]," reasons Barentine. "Advisory circulars don't give you solutions. They just tell you how things are supposed to be."

He offers driver training as an example. Regulations require that anyone who drives a vehicle in aircraft operating areas needs

to be versed in all requirements about the specially designated real estate. "But there's nothing in the rules and regulations that tells you how to accomplish that," he emphasizes. "They just say everyone has to be trained every 12 months."

After Barentine posted comments about the issue, numerous airports chimed in with descriptions of training programs they had already implemented. Suggestions ranged from simple safety videos to more complex, multi-format initiatives.

McNally reports that snow removal is the top issue on *fieldmaintenanceforum.com*. "Here in Grand Rapids, we're Snow Belt, and people talk about snow removal and the challenges it creates," he comments. "This is the one issue that certainly impacts the bottom line of many airports."

Personal Outreach

While both founders personally financed the development and launch of their online ventures, Barentine offsets some of his ongoing costs with advertising by two industry businesses, Sightline and Flex-O-Lite. McNally is currently preparing to do the same.

To date, all postings on the forums have been positive, constructive and informative, report the founders. Each reviews the comments posted on his respective site, and neither has had to remove any material. "We monitor it very well and we put in disclaimers," says McNally. "It's never gone down the road where we've had to get involved."

Initial interest in *fieldmaintenanceforum.com* was strong, but traffic slowed after two years. After consulting numerous website developers, McNally is updating the site to make it more intuitive. "Visually, it was good, but from a user-friendly standpoint, it needed help," he remarks. "It just wasn't user-friendly enough to get people to come back to it again and again."

Refinements aside, McNally is excited about the online forum's future, because he feels that it provides a format that will prove useful long after the details of specific postings and discussion topics change. "I wanted something that would never fade away in terms of opportunities for information exchange," he relates. "I went forward with the thought that there are people out there that can make my job a whole lot easier and there are things that I can provide other people that can probably be valuable to them as well. And that's the whole idea behind the forum." ✈️

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Specifications

Operating Pressure:	40,000 psi (2750 bar)
Flow Rate:	12 gpm (45.4 lpm)
Fresh Water Capacity:	3,150 gallons (11924 liters)
Debris Tank Capacity:	1,600 gallons (6057 liters)
Blasting Widths:	6" - 72" (15.2 cm - 182.8 cm)

6 Inch (15.2 cm) Wide Thermoplastic Line Removal Rate: 6,500 linear ft/h (1,981 linear m/hour)
Rubber Removal Rate: 40,000 ft²/h (3,716 m²/h)



Stripe Hog - SH7500

9 gpm (34.1 lpm) @ 40,000 psi (2750 bar)

Specifications

Operating Pressure:	40,000 psi (2750 bar)
Flow Rate:	9 gpm (34.1 lpm)
Fresh Water Capacity:	1,220 gallons (4618 liters)
Debris Tank Capacity:	750 gallons (2500 liters)
Blasting Widths:	6" - 72" (15.2 cm - 182.8 cm)

6 Inch (15.2 cm) Wide Thermoplastic Line Removal Rate: 5,557 linear ft/h (1693 linear m/hour)
Rubber Removal Rate: 30,000 ft²/h (2787 m²/h)



Stripe Hog - SH1000

3 gpm (11.4 lpm) @ 40,000 psi (2750 bar)

Specifications

Operating Pressure:	40,000 psi (2750 bar)
Flow Rate:	3 gpm (11.4 lpm)
Fresh Water Capacity:	200 gallons (757 liters)
Debris Tank Capacity:	100 gallons (379 liters)
Blasting Widths:	6" - 14" (15.24 cm - 35.56)

6 Inch (15.2 cm) Wide Thermoplastic Line Removal Rate: 1625 linear ft/h (495 linear m/hour)
Rubber Removal Rate: 7,200 ft²/h (669 m²/h)

Stripe Hog Applications



Pavement Marking Removal



Airport Apron Cleaning



Paint Cleaning & Rejuvenation



Surface Preparation

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Stripe Hog - SK2000

5 gpm (19.3 lpm) @ 40,000 psi (2750 bar)

Specifications

Operating Pressure:	40,000 psi (2750 bar)
Flow Rate:	5 gpm (19.3 lpm)
Fresh Water Capacity:	600 gallons (2271 liters)
Debris Water & Waste:	1,025 gallons (3880 liters)
Blasting Widths:	6" - 22" (15.2 cm - 55.9cm)

6 Inch (15.2 cm) Wide Thermoplastic Line Removal Rate: 4,332 linear ft/h (1,320 linear m/hour)

Rubber Removal Rate: 12,000 ft²/h (1,114 m²/h)



Utility Hog - UH1000

Pavement Cleaner

8 gpm (30 lpm) @ 7,250 psi (499 bar)

Specifications

Operating Pressure:	7,250 psi (499 bar)
Flow Rate:	8 gpm (30 lpm)
Fresh Water Capacity:	610 gallons (2,309 L)
Debris Water & Waste:	132 gallons (499 L)
Blasting Widths:	8" - 36" (20 cm - 91 cm)

Pavement Cleaning Rate: 20,000 ft²/h (1,858 m²/h)

Cure Compound Removal: 15,000 ft²/h (1,394 m²/h)

Stripe Hog Applications



Runway Rubber Removal



Curing Compound Removal



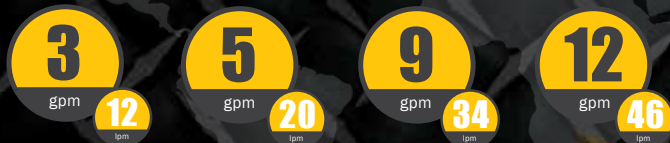
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FACTS & FIGURES

Project: Airfield Maintenance Program

Location: Charlotte Douglas (NC) Int'l Airport

Approx. Equipment Costs: \$4.2 million

Audit & Training Costs: \$74,300

Funding: Capital improvement program; passenger facility charges

Airfield Markings Consultant: Sightline

Rubber & Paint Removal: Stripe Hog SH8000 (Waterblasting Technologies)

Paint Stripping: M-B 357 Paint Truck (M-B Companies)

Surface Pressure Washer: Cyclone CY5500 (Nilfisk Cyclone-Team Eagle)

Friction Tester: Skidometer BV11 Friction Tester (Fortbrand)

Mowing Equipment: Jacobsen HR 9016T

Snow Removal Vehicles: Vmmas (Fortbrand)

Rotary Plow/Snowblower: North Star (M-B Equipment)

Runway Deicer: Tyler Deicer (Wausau Equipment)

Strategy: Invest in maintenance equipment & staff training to achieve best practices in all areas of airfield maintenance

Charlotte Douglas Int'l Boosts Airfield Maintenance Program

BY ROBERT NORDSTROM



Charlotte Douglas International (CLT) has invested heavily in its airfield maintenance program over the past several years. From airfield markings and lighting to snow removal, landscape operations and wildlife management, the North Carolina airport has committed time and resources to its comprehensive effort.



CHAD HUSKINS

What's driving all of the initiatives? Ensuring the safety and security of nearly 45 million passengers, explains CLT Field Maintenance Manager Chad Huskins. "First and foremost, we want to make sure we're operating a safe airfield," he emphasizes. "Having the proper equipment and highly

trained staff who know what they are looking for when they get out on the airfield is critical to achieving that goal."

Education & Equipment

Airport officials have made a concerted effort to take a proactive, rather than reactive, approach to airfield maintenance, informs Huskins. "The FAA regularly sends inspectors to conferences for training on what to look for when inspecting airfields. Here at CLT, we have taken the initiative to make sure our folks are as well trained as FAA inspectors in airfield maintenance issues. We want to be on the cutting edge."

Several years ago, for instance, CLT maintenance staff attended a conference that included a session with detailed information

on how to evaluate and analyze airfield paint markings. Afterward, the airport hired Sightline, the company that presented the information, to conduct an audit of its airfield markings. Trainers from the company also taught airport staff how to evaluate paint markings and how to measure bead application for proper reflectivity.



MIKE SPEIDEL

Sightline Vice President Mike Speidel praises the general evolution of CLT's airfield maintenance program, and its markings program in particular. "A lot of

airports take a reactionary approach to airfield markings. That is, they typically paint as much as they can prior to an imminent FAA inspection and then react to the inspector's comments. But in many instances, when airports take a reactionary approach, it's like putting lipstick on a pig. After the inspector leaves, the airport returns to its earlier behaviors."

The audit and subsequent training from Sightline complements other investments the airport had been making in airfield marking equipment. "We were investing in new equipment and methods of operation," notes Huskins. "We made a major investment in paint and rubber removal equipment and purchased our own friction testing equipment, a task that previously had been contracted out."

The airport purchased a Stripe Hog SH8000 rubber and paint removal machine and switched from using palletized striper that attaches to a pickup truck to a full-size M-B 357 Paint Striper truck. To clean the ramp and apron areas, CLT added a Nilfisk Cyclone CY5500 surface cleaner pressure washer, which recycles the water it uses and collects surface material.

Prior to purchasing a water-blasting system, the airport removed rubber from its airfield pavements with a chemical peel method that required four employees. Paint removal, however, was performed by an outside contractor, and scheduling the work had proved problematic, notes



An M-B paint truck and Stripe Hog (right) are key pieces in the airport's fleet.

Airfield Marking Supervisor Michael Fabbiano.

By purchasing new equipment and handling paint removal in-house, the airport saved \$447,000 in outside contractor fees from July 2015, when CLT's new Stripe Hog unit went into operation, to this July.

The goal, Speidel explains, is to paint less and clean more. In order to clean markings rather than paint new ones, however, markings need to be applied correctly. If markings are applied properly, he elaborates, maintenance staff can use a water blaster to clean them multiple times before they need to be painted again. That's how airports save money, he stresses.

All told, CLT invested nearly \$1 million in equipment for airfield paint operations, reports Huskins. "Not only does it save significant dollars, it also gives us huge flexibility in performing our work," he adds.

Many Moving Parts

CLT has taken a broad-brush approach to expanding and improving its airfield maintenance operations. The airport purchased three used Vmmas snow removal vehicles and recently added a fourth new unit. According to airport staff, the equipment has reduced snow-clearing time from 45 minutes to 15 minutes per runway. Crews use a new M-B North Star snow blower to safely remove windrows, and a new 4,000-gallon Tyler Deicer with



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75-foot booms keeps runways operational during occasional inclement weather events.

When the snow melts and grass starts growing again, CLT's new high-end mowers kick into gear. The airport, in fact, recently tested new equipment for the Charlotte branch of Jacobsen, a mower manufacturing company.

"Our old mowers were big, hard-to-maneuver tractors with pull-behind decks," Huskins recalls. "The operator would have to constantly look back to make sure he didn't damage light fixtures. The new mowers have everything to the front and sides of the operator. The operator can raise the deck on either side."

To prevent runway incursions from wildlife, CLT reduced bird and animal habitats by mulching 30 acres of airside land. Plantings feature vegetation that is decidedly unattractive to birds. The airport's landscape master plan, in coordination with its wildlife management plan, avoids invasive species in favor of drought-tolerant native species.

Currently, CLT is in the process of converting taxiway and runway lighting to LED fixtures. This past year, the airport

converted all ramp and cargo ramp areas to LED, which is saving the airport \$82,000 annually, Huskins informs.

Team Effort

Developing and maintaining a top-notch airfield maintenance program requires communication, coordination and cooperation among various departments and players at the airport, Huskins advises.

"It's a team effort," he emphasizes. "That includes development and engineering staff as well as operations and field maintenance staff. And, of course, we need the support of upper management to provide us with the necessary manpower and tools."

Since last year, CLT has added 13 people to its Field Maintenance Department, growing it from 38 to 51 employees.

"I like to think of Charlotte as a great team that just keeps coming together year after year to get the job done," Huskins enthusiastically summarizes. "That's what makes us successful. Everyone has a strong desire to make CLT the best airport in the industry." ✈️

Congratulations CLT.

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CLT boosted efficiency and improved safety by conducting a marking assesment, on-site training & quality control services.

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Henderson Executive Installs LED Ramp Lights

BY DAN VNUK



FACTS&FIGURES

Project: LED Ramp Lighting

Location: Henderson (NV) Executive Airport

Total Cost: \$4 million (ramp expansion & lighting)

Funding: Airport Improvement Program; Dept. of Aviation

Construction Timeline: 90 days

Completed: Nov. 2015

Electrical Contractor: Royal Electric

Lighting Subcontractor: ADB Safegate

Product Name: ewo

Expected Service Life: 50,000+ hours

Key Benefits: Improved airfield safety; enhanced visibility & less glare; fewer complaints about light pollution from neighbors; 50% reduction in energy usage

When you hear the phrase “bright lights, big city,” Las Vegas may be one of the first places that comes to mind. Effective light management, however, is an exacting science that takes into account many variables such as lumens, energy usage, lamp longevity and even light pollution. All of the above and more came into play when Henderson Executive Airport (HND), located in the very shadow of Vegas’ world-famous “strip”, expanded its airfield ramp area and installed new lighting during a four-month, \$4 million project last fall.

HND’s new fixtures use light emitting diodes (LEDs)—the latest, brightest technology available. As such, it is one of the first airports in North America to leverage the technology in a ramp area. Among the many benefits: neighbors don’t complain about light pollution anymore and the airport expects to cut its energy consumption nearly in half.

Originally known as Sky Harbor Airport, HND was renamed in 1996, when it was purchased by Clark County to be used as a reliever facility for nearby McCarran International Airport.

Since then, the Clark County Department of Aviation has invested more than \$30 million to create a premier business aviation airport, reports Airport Manager Bruce Daugherty. “The new and improved Henderson Executive Airport caters to business aviation, while continuing to meet the needs of the general aviation community. By developing Henderson Executive Airport as an attractive, convenient and economical alternative to McCarran, Department of Aviation officials hope to increase capacity at the nation’s eighth-busiest airport by attracting corporate flyers to the first-class facility.”

In the years following its purchase, the county has completed several major projects, including the construction of two parallel runways, the longest being 6,500 feet. It has also added substantial utility infrastructure, a new maintenance building and 15 acres of ramp for aircraft parking, complete with three shade hangars.

“As the Las Vegas valley continued to grow, Henderson Executive Airport is now an integral part of the thriving community of Henderson and is only a few miles from the south end of the popular Las Vegas Strip,”

Daugherty says. "With new runways and buildings, [we have] become a first-class reliever for McCarran

International Airport and an integral part of the Clark County Airport System, which also includes North Las Vegas, Jean Sport Aviation Center and Overton/Perkins Field."

Throughout the airport's growth and development, officials and staff focused on providing friendly and personal service, he adds.

Accommodating More Jets

When HND expanded its ramp with 675,000 square feet of new space, adding tie-down space for transient jets was a primary goal, but improving lighting was also a key component.

"The new ramp and lighting were constructed to accommodate our fixed-base customers, allowing the area previously occupied by them to be used for future expansion to meet the demands of the growing number of transient jet customers visiting the Las Vegas Valley," explains Daugherty. "The project took four months, was completed on schedule and met the goals we set from the start."

Funding for the \$4 million project came from the federal Airport Improvement Program and Nevada Department of Aviation. Because construction occurred away from the airport's main operations area, HND didn't experience any service interruptions during the project.

"Overall, we are very satisfied with the results of the project and would recommend the use of LED lighting to other airports considering it," Daugherty comments.

Happy Pilots & Neighbors

ADB Safegate, the company that supplied the ramp lighting, expects the energy savings associated with the airport's new LEDs to approach 50%. But the inherent efficiency of LED technology is not the project's only benefit.

"Precise lighting from the corner mast locations also increases energy savings, while the multi-layer lighting design ensures that the lumen output is distributed uniformly across multiple LED light units," explains Tim Winkelman, the company's Southwest regional sales manager.




TIM WINKELMAN

The 0.0% upward light ratio of the new system has eliminated complaints from neighbors about light pollution. And reduced glare for pilots and Air Traffic Control personnel increases overall airfield safety.

There are also contingency advantages. "In case of an individual light failure, the full area will remain lit at a slightly lower level of illumination," says Winkelman. "In the event of a power failure, a hot-restart feature ensures illumination is restored in less than a second without the need for additional electronic equipment typically required by conventional lighting systems."

Due to the fixtures' unique housing design, the lights do not require cooling fins, he adds. This feature prevents dirt deposit build-up, which can reduce the lamp's heat-management capability and shorten the product's service life. The anticipated lifecycle for HND's new ramp lights more than 50,000 hours. The modular design of the fixtures helps lower service costs, notes Winkelman. The flat-glass cover offers enhanced protection in demanding environments and facilitates easy maintenance, he explains.

Royal Electric, the local contractor that installed the LED ramp lighting, was proud to be a part of the project that was a North American first. Company owner Randy Sondrial describes the performance of HND's final product as "second to none." 

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Redmond Municipal Uses Communication, Planning to Mitigate Regional Impact of 3-Week Closure

BY KEN WYSOCKY



FACTS&FIGURES

Project: Rebuilding Main Runway

Location: Redmond (OR) Municipal Airport

2015 Passenger Volume: 291,000

Est. Project Cost: \$18.5 million

Funding: \$17.3 million from FAA; \$1.2 million from state lottery program

Main Project Components: Full-depth reconstruction of asphalt runway; grooving; drainage improvements; new high-intensity runway lights

Key Benefit: Enhanced safety

Project Design/Management: Century West Engineering

Phase 1 Prime Contractor: High Desert Aggregate & Paving

Phase 2 Prime Contractor: Knife River Corp. Northwest

Runway Lighting Supplier: ADB Airfield Solutions

Runway Lighting Contractor: Tomco Electric

Primary Goals: Improve runway safety; minimize regional impact of 3-week closure; communicate effectively with wide range of stakeholders

There's no easy way—or good time—to shut down an airport for three weeks, especially a regional hub that serves as a major tourism gateway. But officials at Redmond Municipal Airport (RDM) pulled it off with nary a hitch during a recent \$18.5 million runway reconstruction project.

The central Oregon airport (also known as Roberts Field) was closed from May 2 through 22 while construction crews worked 24 hours a day to rebuild the intersection where RDM's 7,038-foot-long main runway crosses its 7,006-foot-long secondary runway. Closure was the only option, given the airport's somewhat unusual X-shaped runway configuration. Crews performed other work on the main runway during nights before and after the closure period.

"On a scale of one to 10, this project definitely was a 10," reflects Airport Director Zachary Bass. "It kind of kept me up at night, wondering what would happen if we didn't finish in 21 days."



ZACHARY BASS

Century West Engineering, which designed and managed the project, worked diligently to prevent that from happening. "It's fairly

unusual to see an airport closed for this long," notes says Tom Headley, the company's project manager at RDM. "But that was driven by the magnitude of work required in that intersection."



TOM HEADLEY

Regional Ramifications

Given the high stakes, it's no wonder Bass had trouble sleeping. Ramifications of the two-phase runway project reached far beyond the airport grounds. With approximately 291,000 passengers per year, RDM is a key player in the region's economy and a gateway for tourists visiting central Oregon. (About 3.1 million people visited the region this past season alone.) In addition, RDM is the only commercial airport for approximately 135 miles. There are six other smaller airports in the region, including Bend Municipal Airport about 16 miles away, but all are strictly general aviation facilities.

Furthermore, RDM is home to one of the larger U.S. Forest Service bases in the western United States. The base is an important staging point for aircraft used to fight forest fires, notes Bass.



On a micro level, airport officials estimate that the project canceled 2,595 scheduled flight operations—airliners and freight aircraft—and prevented the arrival and departure of about 20,000 passengers. The airport consequently lost about \$270,000 in revenue, mostly through decreased concessions sales, passenger facilities charges and fees for rental cars and parking.

On the plus side, the project required no funding from the airport. The FAA kicked in about \$17.3 million, and the balance was paid for with proceeds from Connect Oregon, a state-lottery backed initiative that pays for transportation infrastructure improvements.

Completing the project on time and without major issues attests to the value of thorough planning with contractors and a comprehensive communication program, notes Bass. Key groups that needed to be kept in the loop included the FAA, airlines, regional tourism and transportation officials, municipal and business leaders, general public—and everyone in between, he quips.

“There were a lot of stakeholders involved,” Bass reflects. “But during the reconstruction, we heard from only six travelers who were surprised to learn that the airport was closed...so we believe our community outreach efforts were very successful.”

Change of Plans

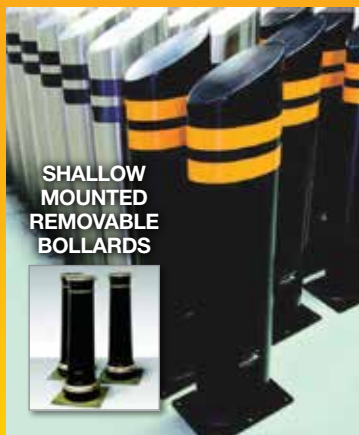
When planning for the project began about 2 ½ years ago, closing the airport wasn't even a consideration. The main runway—which

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The airport scheduled its runway project to minimize disruptions to tourist traffic and aircraft fighting forest fires

was at the end of its 20-year lifecycle and exhibiting longitudinal and transverse cracking—was thought to be a good candidate for a “grind and overlay” surface reconstruction. “That involves grinding off 4 inches of asphalt pavement (about half the total runway depth) and replacing it with new asphalt,” Headley explains.

But that assessment changed when engineering studies revealed that the runway’s longitudinal and cross-slope profiles did not meet current FAA design standards. “It wasn’t unsafe or failed pavement; the existing grades were adequate for their use,” explains Headley. “But they didn’t comply with newer FAA design standards.”

The airport then faced three choices: Obtain a waiver of standards from the FAA; perform a hybrid “best-fit” repair that would meet current standards without a full reconstruction; or perform a full reconstruction to bring the runway up to FAA standards. RDM officials chose a full reconstruction because the FAA was unlikely to fund an option that did not fully comply with current standards, Bass says.

The airport opted to schedule its closure in May for several reasons. First, it was the most likely time for weather conditions conducive with paving operations. Second, airport officials wanted to mitigate any impact on firefighting efforts during the peak of forest fire season, which generally runs from as early as June to September. Furthermore, they wanted to minimize disruptions during tourist season, which peaks in June, July and August.

The FAA divided the project into two phases to spread out costs for the large, expensive initiative. During the first phase, High Desert Aggregate & Paving rebuilt about 1,400 feet of the main runway’s southern leg. Work ran from September through November in 2014, then began again in March 2015 and concluded in April, with the airport remaining open throughout.

“Fortunately, the physical layout/topography of the airport created optimal conditions for a two-phase project,” Headley points out. “A slight rise in the runway formed a perfect tie-in point between the two phases...it created a very smooth match between the existing (second) runway grades and the new runway’s pavement.

“That was significant, because the new grades raised the centerline elevation of the runway nearly 3 feet in some areas,” he continues. “But at this location, there was a smooth match point. Without that, the duration of the second phase would’ve been longer.”

Busy Intersection

Knife River Corp. Northwest served as prime contractor for repaving operations during the second phase. The most critical part of the project was rebuilding the intersection, which required 24,000 tons



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of asphalt and 8,700 cubic yards of crushed rock. Overall, the second phase lasted roughly four months and required 75,000 tons of asphalt.

The intersection work essentially became a separate project within the larger project, because design engineers and paving crews had to contend with correctly melding the centerline rise in the new runway with the secondary runway. "We had to soften the rise for a compliant distance—bring it up gently to come up and over the main runway," he explains. "You can't put a 3-foot-high speed bump in the middle of another runway."

Conveying to stakeholders why that was so important proved to be yet another project within the larger project, adds Headley. "The intersection had its own pre-construction meetings and construction schedule," he notes.

Looking ahead, the secondary runway will require reconstruction in a few years. To minimize disruptions at that point, the airport rebuilt about 1,400 feet of the secondary runway—an area that extends beyond the portion where the two runways intersect—during the recent project.

As such, a full reconstruction of the other runway will not require a prolonged airport closure, Headley points out. "In a sense, we pulled out all the stitches at one time... so we don't have to revisit this kind of major disruption again," he says.

Communication was Critical

Beyond the engineering and execution of the intersection work, a comprehensive communications program proved to be one of the project's most important components. To mitigate the project's impact on regional businesses and tourism, the airport created a 13-member task force that included representatives from "high-reach" organizations such as regional tourism bureaus, hotels and resorts, chambers of commerce, businesses and municipalities. With help from the task force, RDM orchestrated mass emails and press releases to communicate key messages and details about the project.

"We sent mass emails periodically to task force members, such as the Central Oregon Business Association, the Bend and Redmond chambers of commerce, the Central Oregon Visitors Association and the

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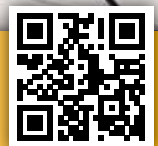
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Traffic resumed in late May after a three-week closure.

Bend Visitor & Convention Bureau,” Bass explains. “Then those groups, in turn, forwarded the emails to all their members. It was a trickle-down effort to get the word out to as many people and parties as possible.”

RDM kept the general public apprised by posting information and project updates on its website. Task force members also used their websites to enhance community-outreach efforts. In addition, the airport tried to attract media coverage on a monthly basis. “Media interest was not a problem,” Bass reflects. “It was a big story, so news organizations were happy to come out and do stories about it.” The year before work began, Bass gave presentations about the project to various task force organizations.

Cooperation and communication with the airport’s commercial airlines also was critical. More than one year before the project began, officials contacted carriers and urged them to not accept RDM ticket bookings during the planned construction period. Because airport projects are notoriously beset by delays, Bass says it was sometimes difficult to get carriers to believe RDM’s construction would proceed as scheduled. “But we overcame that with continual contact for months and months,” he says. “We created a list of the appropriate contact people at each airline and relied on emails and phone calls. They started blocking out ticket sales about nine months ahead of time.”

Alaska Airlines, American Airlines, Delta Air Lines and United Airlines were among the carriers that were affected.

Keeping It Positive

With work crews busy on the airfield, RDM made constructive use of its downtime with a variety of landside projects. “An airport is rarely closed for three weeks, so we made the best of it,” Bass recalls. “We made lemonade out of lemons—took a bad situation and made it as positive as we could for central Oregon.”


During the closure, RDM performed in-depth cleaning and maintenance throughout the terminal, built a new children’s play area and updated a kitchen exhaust hood. Outside, crews sealed cracks in the parking lot and on a lane used by taxis, applying a total of 15,000 pounds of pavement sealant.

The airport also took the opportunity to hold two large events. One was an economic development luncheon for about 250 attendees, which offered a prime opportunity to highlight RDM’s importance to the regional economy. RDM also hosted five days of “active shooter” drills, which provided crucial training for 200 local police officers, 80 firefighters and 50 emergency medical technicians.

“We’re one of largest public places in central Oregon, so the airport is a great place to practice those kinds of live action drills, which we could never do with the TSA present (during normal operations),” Bass explains. “It was a weird environment for a week—lots of fake screams and gunshots. We pushed that out to the media, too, so it allowed us to keep spreading the message that the airport was closed.”

What advice would Bass offer to other airports facing closures? “Start planning early, and bring the right people to the table,” he suggests. “Make sure all stakeholders are aware of what’s happening well ahead of time.”

“Effective communication that comes early and consistently is *the* most critical component,” Headley emphasizes. “You can’t just tell all the parties early on what’s going to happen and then walk away. You have to start talking early and keep on talking.

“You also must decide who needs to be at the table, especially when this many people and businesses are affected by work at a significant regional aviation hub,” he adds. “We took it upon ourselves to ensure that the proper people were invited to the planning process...there was a lot of forward thinking on the part of the airport to make this project work.” 

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FACTS&FIGURES

Project: Using New Environmental Aircraft Deicer

Location: Memphis (TN) Int'l Airport

Goal: Reducing Negative Impact on Local Water Resources

Customer: FedEx

Strategy: Procure deicing fluid with 50% lower fluid toxicity

Resulting Product: Polar PLUS LT

Product Mfr: Cryotech Deicing Technology, a div. of General Atomics Int'l Services Corp.

Product Characteristics: Low aquatic toxicity & lowest operational use temperature with excellent wetting/low foaming properties; certified by EPA & FAA; meets SAE Int'l AMS1424 Aircraft Deicing/Anti-Icing standard.

Product Testing Results: 123% survival improvement for water fleas; 396% improvement for fathead minnows



Some say it takes a village to raise a child. Along the same lines, it took an airport, a product manufacturer and a delivery service giant to decrease the environmental impact of aircraft deicing operations at the busiest cargo airport in the United States.

The negative impacts of deicing fluids on bodies of water, particularly smaller streams receiving water runoff, are well documented. Concerns include low oxygen conditions; issues with waterbody color, odor and foam; fish kill events; damaged aquatic communities and the widespread absence of aquatic life.

Memphis International Airport (MEM), Cryotech Deicing Technology and FedEx all take such problems seriously. Together, they recently devised a way to create and deploy a more environmentally friendly aircraft deicer—

in short, keeping planes safe in a more sustainable way.

Each night, FedEx processes 1.2 to 1.6 million packages at its “super hub” at MEM. It also sends 150 to 200 jets into the skies every half-hour. Throughout the past several years, the company has taken numerous steps to decrease the environmental impact of its operations at MEM and around the world. The company has greened its packaging; reduced fuel consumption by upgrading its aircraft and delivery vehicles; and built all of its new facilities according to Leadership in Energy & Environmental Design (LEED) guidelines.

With these efforts already in play, greening airside operations at its bustling MEM hub seemed like a logical next step. When concerns arose about the impact of deicing fluid on local water resources, FedEx's



to Develop Greener Deicing Fluid Int'l

BY RONNIE GARRETT

sourcing team challenged manufacturers of this operationally crucial fluid to develop a more environmentally sensitive product. The company used an exacting request for proposal (RFP) with strong environmental standards to issue the challenge. It leveraged support from suppliers by guaranteeing them a two-year extension on a three-year contract to supply deicing fluid *if* they developed a new product with equal performance but 50% lower fluid toxicity for use in the fourth and fifth years of the contract.

Cryotech Deicing Technology, which was already supplying aircraft deicer to FedEx at approximately 100 U.S. airports, rose to the challenge. Actually, the task was right up Cryotech's alley, as it specializes in producing acetate-based products, because acetates are readily

biodegradable and exhibit low toxicity to vegetation and aquatic life.

"As a major manufacturer and supplier of aircraft deicing fluids, we are acutely aware of our responsibility to recognize shifting market conditions and respond to customer needs," says Craig Starwalt, the company's president and chief executive. "Opportunities to improve our environmental profile have always been a key research and development metric. This, coupled with input from a top customer, cemented our decision to commit to the development of what is now Polar Plus LT."

The new product not only meets FedEx's environmental requirements, it also dovetails nicely with the MEM's green goals. The busy airport, which serves 3.8

million passengers and moves 9.5 billion pounds of cargo every year, highlights environmentalism in its mission statement: "To follow and to promote good sustainability practices, to reduce the environmental impacts of all our activities and to help our partners to do the same. Our commitment to sustainability is and will continue to be one of the primary focuses for our airport."

Lori Morris, manager of environmental services for MEM, explains the airport's position: "The Memphis-Shelby County Airport Authority [which operates MEM] works closely with all



LORI MORRIS

our airline partners encouraging the use of new technology and equipment to reduce impacts to the environment. Maintaining compliance with environmental regulations is a priority at MEM, and that only comes from being good stewards of our community and the environment.”

Morris acknowledges but doesn't accept commonly raised counterpoints for taking action on environmental initiatives. “The Memphis-Shelby County Airport Authority knows the importance of keeping our airline partners and passengers safe and on time,” she says. “We also strive each day to be more sustainable than the last.”

She also stresses the partnership and cooperative spirit the airport has with its largest tenant. “MEM has invested countless hours and dedicated significant financial resources to improving our deicing/anti-icing program,” she notes. “FedEx has



been a leader at MEM in implementing new sustainable technologies regarding deicing/anti-icing operations.”

Starwalt considers the challenge that FedEx issued to Cryotech and other manufacturers a win/win. “FedEx's RFP pushed us in the direction we were trying to go but hadn't really established. In the collaboration that resulted, we both helped each other,” he explains. “We started doing something for environmental reasons, and ended up creating a better product.”

What's the Difference?

In short, chemists and technicians at Cryotech developed a Type I deicing/anti-icing that proved less harmful to aquatic ecosystems. As they explain it, Polar PLUS LT combines extremely low aquatic toxicity and lowest operational use temperature (LOUT) with excellent wetting and low foaming properties (which aid in visual contamination checks). In fact, the product offers the lowest LOUT in the industry for propylene glycol-based fluid: -27.4°F at a 63% Polar Plus LT/37% water dilution, reports Tschudi (Judi) Dinwiddie, the company's associate marketing coordinator.

The product also offers the lowest aquatic toxicity of any propylene glycol-based fluid in the industry, adds Dinwiddie, explaining that this reduces its environmental impact on storm water runoff. In addition, the fluid is triazole-free, does not include nonylphenol ethoxylate surfactants and is readily biodegradable.

Not containing triazole and nonylphenol ethoxylate surfactants is key to the product's environmental profile. “The primary challenge for improving Type I's toxicity profile was to



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A new aircraft deicing fluid from Cryotech is helping MEM and FedEx reduce their impact on nearby water resources.



find ingredients that had a favorable toxicity profile, while maintaining performance equal to or greater than the current Type I fluid, Cryotech Polar Plus,” says Dinwiddie. “This was a difficult task as many key ingredients that provide the optimum performance (for wetting, spreading, foaming, etc.) have the most detrimental effect on aquatic organisms.”

The Cryotech team selected alternatives based on knowledge gleaned from ecological and biological toxicity studies, she explains. The resulting formula succeeded in meeting the standards of FedEx, EPA, FAA and the Society of Automotive Engineers International. (In addition to manufacturing deicers for aircraft and runways, Cryotech also supplies products for highways and other commercial applications.)

Specifically, product trials revealed 123% improvement in survival rates for water fleas, and 396% improvement for fathead minnows. FedEx, in turn, recognized significant potential benefit to all aquatic life.

“Polar Plus LT exhibited 100+/-percent water toxicity improvements,” notes Dinwiddie.


Last winter, select Cryotech customers tested the product in a large-scale trial and lauded the improved formula for its ease of use, environmental characteristics and overall performance, she reports. They also praised the fluid’s wetting and low foaming properties for facilitating easier handling and even dispersal and aiding visual contamination checks.

Moving Forward

Following the trials, FedEx duly extended its contract to Cryotech, and the company is rolling out Polar Plus LT to all of the FedEx locations it supplies.

The environmental benefits of the new product could eventually spread industrywide, as Cryotech is offering it to all airline purchasers in time for the upcoming deicing season. With nearly 45 of the 50 busiest U.S. airports located near bodies of water, the impact could potentially be substantial.

Josh Kurtz, a FedEx sourcing adviser, considers the new deicing fluid a great example of business—vs. governmental policy—driving positive change.

Dinwiddie, in turn, sees it as the manifestation of Cryotech’s mantra about “making customers’ problems go away.” 

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Nantucket Memorial Goes Paper-Free for Part 139 Recordkeeping & FBO Ops Management

BY KRISTIN VANDERHEY SHAW



With more than 16 million annual enplanements, Boston Logan International Airport (BOS) is the undisputed grande dame of Massachusetts. What many people don't know, however, is that during summer, the state's second-largest airport rivals BOS' flight operations due to its own volume of general aviation traffic.

Located on a small island just off the coast, Nantucket Memorial (ACK) prefers to operate its own fixed-base operator (FBO) to accommodate the influx of summer visitors arriving and departing the picturesque area on private aircraft. Because the airport also accommodates regularly scheduled commercial service, ACK needs staff and systems that can manage traffic on both sides of the tarmac. An onsite fuel farm and fleet of fuel tenders carrying 100 LL and Jet-A help the airport accommodate its bustling summer traffic without being overstaffed during the slower winter months.

As ACK grew, however, management realized that some of the airport's processes needed to be tweaked. A recent migration from paper to cloud-based systems proved

to be a major move for the small island facility.

Jamie Sandsbury, ACK's finance and business manager, notes that the airport's previous internal processes were redundant and not optimally efficient. Personnel handwrote purchase orders, maintenance requests and other standard reports, and then carried them to the main office for required signatures. If the appropriate executive was busy or out of the office, employees had to wait or return later, sometimes making multiple trips.

"We were basically 100% paper driven," says Sandsbury. "When processes are completed via paper, things get lost. Handwriting is sometimes messy, and the purchase orders or maintenance orders weren't always easy to read. Also, we're in different buildings across the property; whomever needed to have something signed had to stop what they were doing. That became a time-waster when staff would have to come to the main building and wait for one of us to sign off."



FACTS&FIGURES

Project: Cloud-based Recordkeeping

Location: Nantucket (MA) Memorial Airport

Vendor: VEOCI Software

Contract Signed: Jan. 2015

Cost: Per-user vs. per-module

Key Benefits: Easier, paper-free Part 139 reporting & purchase order processing; no computer server to maintain

Thinning the Paper Trail

Historically, the airport completed most of the processes associated with Part 139 inspections manually, but in late in 2014, it began interviewing several vendors to help automate them.



TOM RAFTER

“We believed that Part 139 inspections would be easily adaptable to other processes we wanted to automate, allowing us to overhaul several departments in succession,” says Airport Manager Tom Rafter. “It’s a fairly simple process.”

Ultimately, the airport chose VEOCI, a cloud-based software system for managing Part 139 compliance/reporting, facility maintenance and property management that Sandsbury and a colleague discovered at a conference.

Rafter and the operations team liked the system’s “building block” approach and the company’s pay-by-user (vs. pay-per-module) pricing model. In terms of hardware, the airport only needed a few additional tablets for airfield personnel.

At first, Rafter was skeptical. Changing from paper to automated processes seemed like a giant leap. His operations team, however, liked the flexibility of addressing a number of different areas without having to purchase individual modules. They also appreciated being able to create new applications on their own. After the ACK team tested the new cloud-based system, Rafter was also convinced.

“You don’t even have to be an IT person to manage it,” says Rafter. It was important to everyone that the new system would not require a great deal of hand holding, he adds.



VISHU RAO

Vishu Rao, VEOCI’s product manager for airports, says his company’s strategy identifies a given process and breaks it down into bite-size pieces users can follow.

After ACK’s staff was comfortable with the Part 139 process, they were able to create several other solutions to common in-house challenges with the same building blocks. First, airport staff laid out the process, step by step. Then, they used a point-and-click interface to automate that process. This method allows them to easily improve the process, because they can make changes and tweak what they have automated, explains Rao.

“Once the airport understands this model, they are off to the races,” he says, noting that users familiar with platforms such as LinkedIn and Facebook become comfortable using VEOCI building blocks very quickly.

The opportunity to get the new system up and running very quickly also proved attractive. Once the needs and processes were established, ACK launched its new FBO system within five days, from concept to implementation.

Now, each fuel truck on the airfield is equipped with a computer tablet and alerts pop up whenever fueling requests are approved. Assigned drivers can head straight for airplanes needing fuel,



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because tail numbers are included on each request. After drivers fuel aircraft, they add comments to that task on the tablet stating how much fuel was used, what was offered, etc.

ACK Operational Supervisor and Aircraft Rescue Firefighter Blain Buckley describes the new process as safer and more efficient. If airliners need fuel, requests with specific amounts are generated at the FBO and pop up for operations staff, who populate them into the dashboard. Personnel inside the “watch room” at the main building distribute work orders as they arrive, thereby reducing the potential for mistakes.

“We specify which truck gets which fueling job, which is one of the critical factors for efficiency for us,” says Buckley. “If we weren’t paying attention, it would have been possible for an aircraft to be fueled twice.”

Empowering Staff

Rao believes it’s important for customers to be able to manage their own software and make changes without having to call a vendor.

“Typically, software is frustrating because it’s designed by a bunch of software geeks who force you to call them to fix a problem or a bug, and suggestions fall by the wayside,” he says.

“We don’t believe in that. Our philosophy is twofold: first, when a customer calls, we get to the root of what is bothering them...it is an opportunity for us to improve. Second, our customers can make most changes and tweaks on their own. Adding custom instructions or fields for additional data is much easier and faster than emailing the supplier and waiting ‘til next year for the new version.”

Recently, ACK added a function to process employee requests for time off. Rao describes the project as fairly complicated, with a myriad of moving parts, because the software had to be set up to follow the hierarchy of seniority within the airport staff when processing requests. Before switching to VEOCI, ACK used an Evernote process in conjunction with email.

The new system also helps ACK track wildlife hazards. When birds or other animals are spotted on the airfield, personnel mark their specific location on a map and record the associated flight path, weather conditions and actions taken. Later, they can generate summaries to present during visits by the U.S. Department of Agriculture.

“Now we can see exactly where wildlife has been, including the track of which way birds are flying from the airfield,” says Buckley. “We break it down to details, like which particular species are on the airfield at 7 a.m. That collection of data is much easier to go back and look through and figure out what is going on. It’s much easier for us to do that onsite and then look back at the history.”

The ramp log works with Windows, Android and iPhone, and all the data is available for inspectors to look at on demand. Each reference number is a live link inspectors can use to pull up work orders, Buckley notes.

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“Over the years we have used many different databases,” Rafter reflects. “Now that we have cloud storage, it’s much easier.”

Buckley says that the new process has enabled staff to determine discrepancies more efficiently and improves airfield safety. “In the past, we’d have to come back to the office with our report, issue a work order, put it in a mailbox, maintenance would come pick it up, and so forth,” he recounts. “This really mainstreams getting that information to the right people.”

The airport also uses its VEOCI system to contact employees who are needed for snow removal or emergency duty. The system sends emails, texts and/or phone calls to staff, records their responses and sends reports to the airport.

Rao reports that the new process facilitates better overall communication among the team. If staff members want to



A high concentration of private aircraft boosts traffic during summer.

see the status of a purchase order, they can log in and see exactly where it is in the process. The system also tracks how many purchase orders are made and for which vendor.

“Being able to customize each feature is important to us, because—like every other airport— we’re unique,” says Sandsbury. “We have a small administrative staff, and time-saving components are important, whenever we can get them.” ✈️

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It's all about connections

Crews Use Advanced Systems Runway at Yakutat Airport

BY JODI RICHARDS



When the main runway at Alaska's Yakutat Airport (YAK) experienced damage from harsh hydrogeological conditions, the state's Department of Transportation and Public Facilities tread carefully when crafting a solution. As owner and operator of the airport, the department knows that any project in the lowlands area around the Gulf of Alaska includes extra hurdles—specifically weather and logistics.

Located 225 miles northwest of Juneau, the remote fishing village of Yakutat (population 613) has no road access. People, provisions and supplies must arrive and depart by air or sea. Barges deliver goods monthly during the winter and more frequently in summer. Alaska Airlines, the airport's only commercial passenger service, provides jet service from YAK twice daily; and the region is also served by air taxis and floatplanes.

During calendar year 2014, YAK logged 19,000 flight operations.

Microblisters & Birdbaths

In the roughly 10 years since its last repaving, YAK's main runway, 11-29, had experienced frost issues due to high ground water, explains Robert Trousil, P.E., senior materials engineer with the state's transportation and facilities department. Hydrologic conditions, coupled



ROBERT TROUSIL

with freezing weather, compromised the integrity of the runway pavement, causing small blisters to emerge on the asphalt runway's surface.

"They would be pretty small, no more than 6 inches in diameter—somewhat indiscernible, especially to a landing aircraft," notes Trousil.

The "microblisters" as he calls them, formed during winter due to frost heave and were scraped off when maintenance crews plowed the runway. When the weather warmed in the spring/summer, small pooling areas appeared on the surface.

Trousil says there were noticeable trends based on, to some degree, the jointing of the WWII-era concrete panels underneath the asphalt and the joints of the pavement itself. "We could see some trends, but there were literally a thousand of these blisters that would manifest themselves as little birdbaths in the summer and would be somewhat raised—maybe a tenth of an inch—in the winter."

Each subsequent year, however, the birdbaths grew a little deeper.

In 2010, the Alaska Department of Transportation (DOT) and Public Facilities developed a significant hydrologic monitoring and evaluation report. Because the runway issues were directly related to the groundwater, the department installed eight ground water monitoring wells and two surface water monitoring locations to assess the hydrologic/geohydrologic conditions in and around the airport.

Data was needed to determine the elevation of the ground water table at the airport, explains Trousil. Transducers in each of the wells and the surface water sites logged water surface elevations every 15 minutes. Water temperature and observations about the runway surface were also recorded. In total, the department collected data for about 18 months. "We had a good idea of how the water table reacted to precipitation and the seasonal fluctuations of the ground water table and how that played out," Trousil notes.

The department used the data to determine that shallow ground water conditions caused ice to form, predominantly along runway joints. A lack of subsurface drainage and capillary breaks beneath the runway structure caused differential heave



FACTS&FIGURES

Project: Runway Repaving

Location: Yakutat (AK) Airport

Owner/Operator: State of Alaska

Runway: 11-29

Length: 7,745 ft.

Width: 150 ft.

Repaving Cost: \$12.5 million

Project Designer: AK Dept. of Transportation

General Contractor: Knik Construction

Infrared Joint Heater: Heat Design Equipment

Intelligent Compaction System: Hamm AG

to Repave



Aircraft used the airport's crosswind runway while crews repaved the main runway.



Photo: Egan J. Gleason

of the runway subgrade and finished surface. According to DOT research at that time, the installation of dewatering mechanisms such as French drains and dewatering wells would not significantly reduce ground water elevations, and ditch improvements would have limited impact reducing the water table beneath the runway.

Based on the research, the department made fairly specific recommendations about how to address the situation, Trousil says. "It drove a lot of the thoughts and ideas of how we approached the project," he recalls.

The state's project design manager, Chuck Tripp, P.E., collaborated with the department's Southcoast Region Materials

and Airport Planning staff as well as the FAA to formalize a plan to address the challenging asphalt conditions.

Ultimately, the strategy was to install a capillary break (to allow water movement) above the water table, remove frost susceptible soils and add non-frost susceptible fill materials on the 29 end of Runway 11-29 to provide separation between the ground water and pavement surface.

Additionally, the project removed a mild but broad hump where the crosswind runway, 2-20, joined the main runway.

Mix Masters

Once the job was awarded, one of the first major tasks was establishing a mix design for the asphalt. Knik Construction, the general contractor, submitted an aggregate source, and the DOT developed a mix design that dictated how much asphalt

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needed to be mixed with the aggregate.

Getting the mix correct, and within FAA specifications, was one of the biggest challenges of the project, Trousil recalls. Typical highway projects often require two iterations of mix designs to nail down ideal proportions. For this project, the team went through six iterations before finding the right gradation to meet air voids. "It was challenging," he relates. "FAA specs are a little more challenging than highway specs to get the right design."

Repairing the Runway

On May 1, YAK closed its main runway and Taxiway A to begin the repaving project. Diverting traffic to the crosswind runway allowed the airport to remain operational, while shutting down the main runway completely (vs. using a series of shorter nightly closures) allowed the project to proceed in a safe and timely manner, says Airport Director Robert Lekanof Jr.

On the main runway, crews milled off at least half of an inch to remove grooves, repair damage and prepare the surface for a new layer of asphalt. On the crosswind runway intersection, they milled off up to 6 inches to remove the hump and improve drainage. Local fill was used to raise the 29 end of the runway by 2½ feet, and the entire surface received 6 inches of asphalt, paved in two 3-inch lifts.



AMANDA GILLILAND

With 62,000 tons of asphalt, YAK's runway work is the state's largest paving job in 2016, reports Amanda Gilliland, P.E., Knik's project manager. It is also the first runway project in Alaska where

the company used an infrared joint heater, she adds. Typically, FAA specs require contractors to cut 4 to 6 inches off the edge of asphalt and then pave the area to eliminate the low-density portion. At YAK, Knik used a joint heater, from Heat Design Equipment, to reheat the old asphalt. This allowed crews to pave against it and achieve the necessary density to provide a seamless, watertight edge, explains Gilliland.

The joint heater, which Knik had used on other airport and roadway projects, provides multiple benefits. Notably, it saves money

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Due to YAK's remote location, the contractor had to haul in its own equipment, materials and lodging for crews.



by reducing material waste. “If you’re going to trim 6 inches of asphalt off 8,000 feet of runway, on each joint, it’s just a lot of waste,” she comments. “[The state] would be paying for asphalt that you just end up grinding up and throwing away.”

The heater also makes jobs much less labor-intensive for crews, and ultimately produces better results for customers, adds Gilliland. “You’re reheating the edge and getting more interlock with the aggregate in the asphalt, so I think it makes a better joint,” she explains.

In addition, Knik used echelon paving, with pavers working side-by-side, but slightly offset to smooth the asphalt. The process reduces the number of joints, which are the weakest points of asphalt. At YAK, 14 joints were reduced to five.

A HAMM intelligent compaction system helped improve rolling accuracy during paving operations by leveraging global positioning system technology. The system’s computer provides real-time data about the surface, displaying on screen precisely where workers have rolled. “It takes the guesswork out of it and guarantees they’re going to have consistent coverage,” Gilliland says.

The system also records data such as speed, amplitude and temperature, making it a valuable tool for troubleshooting if pavement issues emerge later. “You can go back and look at what settings the roller was on, how many passes crews were doing, what the temperatures were,” she explains.

Weather & Logistics

From his seat as airport director, Lekanof feels that the runway project went smoothly and quickly, despite weather that sometimes halted progress. A wet August made painting a fourth-quarter struggle, with rain continuing for 10 days at a time.

Despite such challenges, the airport reopened its main runway on Aug. 24. For the nearly four months it was closed,

YAK stayed operational by using its crosswind runway. Keeping on schedule was challenging for Alaska Airlines, because heavy rains on the ungrooved crosswind runway caused delays and cancellations.

Weather played a huge role throughout the project, Gilliland reflects, but her crew managed to complete the project within the limited construction season. (Yakutat receives some of the heaviest precipitation in the state, averaging 132 inches of rain and 219 inches of snow annually.)


When the weather cooperated, Knik’s team produced up to 6,000 tons of asphalt per shift—impressive results when working with a mobile asphalt plant, notes Gilliland.

“They put down a record amount of pavement in a pretty short amount of time,” adds Trousil. “That capability helped the project really take advantage of the weather they had, as well as using their resources to the best that they could.”

Yakutat’s remote location and complete lack of road access added considerable challenges for Knik. With air, ferry or once-monthly barge service, preparing for the project was a carefully orchestrated exercise.

The contractor not only brought in trucks and construction vehicles, it also imported a parts and maintenance shop to keep them running. In addition, crews manufactured all of their own hot rock and crushed aggregate with asphalt and other plants, which the company also transported from home.

To support the project, Knick delivered 3,500 tons of asphalt cement. In the “lower 48,” a manufacturer would have simply trucked material to the plant each day.

Knick even transported a mobile camp to provide lodging for its workers during the project, because basic project necessities were simply not available locally. “It all comes down to planning,” Gilliland reflects. “You really have to try and think of everything.” 

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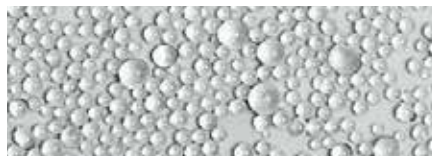
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Troy Municipal Overcomes Environmental & Cost Issues With Alternative Instrument Landing System Antenna

BY NICOLE NELSON



FACTS & FIGURES

Project: End-fire Glide Slope Antenna Installation for Instrument Landing System

Location: Troy (AL) Municipal Airport at N. Kenneth Campbell Field

Site: Runway 7-25

Involved Parties: City of Troy; U.S. Army; FAA; ALDOT Aeronautics Bureau; Goodwyn, Mills and Cawood; Watts Antenna Company

Construction Cost: \$875,000 (including build-out of a retaining wall, relocation of old glide slope shelter & construction of access roads)

Overall Cost: Nearly \$1.1 million

Funding: FAA – 90%; Alabama Dept. of Transportation Aeronautics Bureau – 5%; City of Troy – 5%





To continue supporting high levels of general aviation and military activity, Troy Municipal Airport at N. Kenneth Campbell Field (TOI) completed a bevy of requisite steps to begin the extension of its primary runway. Permits and land were acquired, the site was prepped and new pavement was installed.

And then the project got complicated.

When the Alabama airport began finalizing the last few details for its plans to lengthen Runway 7-25, officials came to the unsettling realization that the relocation of the glide slope instrument landing system (ILS) had been overlooked.

Needless to say, the project came to a halt. Not only did the airport lack the necessary land, but the specific area needed for a critical portion of the glide scope was also a wetlands habitat fraught with environmentally sensitive elements.

“We didn’t have any dirt there; we just had a 50-foot void,” explains Airport Manager Trent Crawford. “We didn’t have the necessary land there needed to reflect the image-type ILS signals from the antenna.”

Completing the ILS with a traditional image-type glide slope would have required environmental mitigation, property acquisition and major construction—not to mention significant time and cost. So TOI went back to the drawing board. In October 2012, the airport hired Goodwyn, Mills and Cawood and challenged the architectural and engineering firm to find a cost-effective solution to its glaring airfield problem.

The firm’s Airport Planning and Engineering Department immediately researched FAA regulations on image glide slope systems as well as specifications for a lesser-known alternative, an end-fire glide slope.

“Most airports would never even consider, or have even heard of, those types, because they have the ground and they just put up a normal image antenna,” explains Project Manager Michelle Conway. “Since we didn’t have that option here, we had to look at the outside-the-box type of antenna, which is the end-fire.”



MICHELLE CONWAY

Dark Horse Solution

“I had never heard of (an end-fire glide slope antenna) and I had never worked on one,” Conway acknowledges, noting that all previous U.S. installations were federal projects conducted internally by the FAA. “When we got the call from Troy that it was going to cost \$2 million to fill in the dirt and have an image glide slope in this location, they wanted to know if there was anything else that could be done.”

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Personnel from Goodwyn, Mills and Cawood scoured multiple sources researching and analyzing alternative options for the airport's difficult situation. While doing so, they discovered that unlike image glide slopes, where the glide slope signal is bounced off the ground in front of it, end-fire glide scopes bypass the ground plane to use the antenna array itself to project signals outward. This arrangement not only provides benefits for airports like TOI with limited or environmentally sensitive land, but also in waterside installations and at sites with significant terrain issues.

Goodwyn, Mills and Cawood then consulted with John H. Johnson Sr., president of Watts Antenna Company, to discuss the potential use of an end-fire glide slope for this situation. Because of its frangible tubular fiberglass design, an end-fire system can be relatively close to the runway, with the electronic equipment shelter constructed outside the runway safety area on the downslope side of the embankment.

With 60 successful installations worldwide, Johnson confirmed that the end-fire system was developed for difficult sites such as TOI.

"Difficult meaning complex, in the manner of limited ground, limited installation area,



or some complex terrain that would hinder normal, or the average landing systems, from playing,” Johnson explains. The main antenna sections of the end-fire are spaced at 430 feet longitudinal and at a height of approximately 4 feet, whereas a tower type would be at a minimum 21 feet high, he adds.

“In Troy’s case, there was the displacement of the antenna from the runway centerline for runway safety and an obstacle-free zone,” notes Johnson. “Their shelter is down over the side, and they didn’t have a lot of lateral land mass to put a conventional image type.”

Million Dollar Bargain

During planning phases, the team from Goodwyn, Mills and Cawood became increasingly aware that an end-fire system was not a typical installation—not only due to its design and physical attributes, but also because of its cost. End-fire antenna equipment is significantly more expensive than traditional image glide slope antenna equipment, with individual prices starting at \$350,000. The end-fire system TOI ultimately debuted in May 2014 cost \$1.1 million and proved to be a bargain compared to the overall project’s \$2 million construction price. (The \$1.1 million antenna cost included engineering design, construction materials, sub-consultant fees, FAA flight inspections and certifications.)

“Basically, the system [required] very minimal site preparation and saved a lot of money, and a lot of time, with a project that had already been going on for quite some time,” Conway says of end-fire glide slope array now located between the taxiway and runway.

“We didn’t know how it would perform until we actually got the FAA flight check out there to commission and certify the system. To date, there have been no problems with it whatsoever,” he reports. “It has been a wonderful project, and it was a huge task to overcome.”

In addition to overcoming all of the obstacles in play, the system at TOI is also important for another reasons observes Johnson. “It is the first time the end-fire has been installed by a private contractor to support a dual use of civilian and military operations,” he explains, noting that the antenna of the ILS glide slope was installed by the U.S. Army for training purposes at Fort Rucker. “The partnership is the unique aspect.” ✈️

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Think About It

 It was early July 2014, when I received word that a commercial aircraft carrying more than 140 passengers experienced a close encounter with a UAS (unmanned aircraft system) on final approach to our airport. While I was already plugged in to the UAS issues that were growing around the country, this hit home and got my full attention. It was around that time that an increasing number of aircraft encounters with UAS in the vicinity of major airports were being reported around the country. You may recall a series of drone sightings by air carriers in the New York City airspace that got a lot of national news attention. Headlines in major newspapers read: “Increase in Drones Spotted Near Aircraft;” “Near Collisions Between Drones, Airliners Surge, New FAA Report Shows;” “FAA Official: Drone, Jetliner Nearly Collide Over Florida” and “Close Encounters on Rise as Small Drones Gain in Popularity.”

This caused great concern in our industry and I am sure that every airport manager in the country engaged in some kind of public relations initiative geared toward getting the word out about drone/UAS safety around airports. We all remember “Know Before You Fly,” FAA’s UAS public awareness campaign in late 2014. This was the 5-mile, 400-foot, line-of-sight, get-permission program.

The number of encounters continued to increase in 2015, and calls for more immediate action from Congress, the airlines and the public were beginning to be part of the weekly news cycle. For its part, Congress had already passed legislation as part of the FAA Modernization and Reform Act of 2012, directing the FAA to “accelerate safely the integration by Sept. 30, 2015,



GREG KELLY


Greg Kelly, A.A.E., is executive director at Savannah/Hilton Head International and executive director of the Savannah Airport Commission. In addition, he serves on the board of directors for Airports Council International – North America, the Southeast Chapter of the American Association of Airport Executives and the Small Airports Committee for Airports Council International. Kelly is also a primary coordinator for the Southeast Airports Disaster Operations Group.

of Civil UAS in the national airspace system.” But in early 2015 there was a growing frequency of UAS/airline encounters, which appeared to be moving the discussion to potentially more restrictive legislation.

At the time, I was as concerned as anyone else, but I remember thinking that while the UAS issue was a growing and very serious safety concern, the systems clearly had the potential to be a real asset to airport operators as the technology evolved. I became concerned that the ongoing and growing push for more UAS regulations and restrictions could potentially result in short-sighted actions that would adversely impact, if not eliminate, the possibility of airport operators using drones. While I was as determined as everyone else to prevent UAS conflicts with aircraft, I became equally determined to make sure the door remained open for airport operators to use drones in the future.

Working with Woodie Woodward of Woodward & Associates, we were able to schedule a series of meetings with various FAA officials involved in UAS integration and safety to present our case. We made the case for a variety of uses for drones at airports: day/night perimeter checks; runway light and surface checks; monitoring, assessing and deterring wildlife hazards; and

enhancing operators’ ability to monitor projects and manage incidents. Instead of pushback, the FAA was open to and interested in the discussion. In fact, we are now working toward implementing a program to test several of these scenarios at our airport. Our original thought was to purchase our own UAS platform and apply for our own permit; but it was suggested that we use an existing permitted UAS operator. We are now about to enter an agreement with Woolpert so we can begin our program.

Other airports see the same potential and are working toward the same objective. It is also good to see that both Airports Council International – North America and the American Association of Airport Executives have committees in place that are working with the FAA and other groups to integrate UAS operation on and around airports, safely. As we have seen with Uber and Lyft, the transportation network companies have and are integrating into the fabric of airports. There is no doubt that unmanned aircraft systems will also become part of the fabric at our airports. As such, there are opportunities for us to use them safely to enhance security, safety and other operational efforts in our day-to-day operations. 



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