



FACTS&FIGURES

Project: Centralized Deicing Facility

Location: Chicago O'Hare Int'l Airport

Size: 835,000 sq. ft.; 10-position composite pad with 10 staging positions

Maximum Capacity: 60 aircraft/hour

Funding: Chicago Airlines Terminal Consortium

Timeline: Facility opened in winter 2018; computerized system went live Dec. 2020

Facility Management: Chicago Dept. of Aviation

Service Providers/Facility Planning

Partners: United Airlines; American Airlines; Integrated Deicing Services

Primary Deicing Agent: Neat fluid, blended in application trucks

System Design: JCAI Inc.

Surface Guidance System: SmartPad

Web-Based Deicing Management System: Icelink

Independent Performance Evaluation: Frost & Sullivan

Of Note: Largest centralized deicing facility in the U.S.

Key Benefits: Improves safety & efficiency; helps decrease flight delays; provides valuable operational data for planning & analysis

O'Hare Moves Aircraft Deicing From Gates to High-Tech Centralized Facility

BY JENNIFER DAACK WOOLSON



Chicago is widely known as the Windy City, but it's also snowy and icy. That creates challenging conditions at Chicago O'Hare International Airport (ORD), said to be home of the busiest sustained winter airport operations in the world. This past season, for instance, it processed more than 1,200 flights per day.

For decades, deicing aircraft was a gate-based operation at ORD. Then, in December 2018, the airport opened a new 835,000-square-foot centralized deicing facility with 20 bays (10 for treatment, 10 for staging). And that was just the beginning of even more improvements.

Even as COVID-19 brought air travel to staggering lows in 2020, the Chicago Department of Aviation continued talking with United Airlines and American Airlines about ways to completely modernize the deicing system at ORD. Discussions and planning included a wide variety of disciplines: deicing, ramp control, flight operations, ground safety,

corporate real estate, continuous improvement and the airlines' station operations control and network operations control.

The collaboration resulted in a system that the project team categorically refers to as the most technologically advanced and safest deicing approach in the world. The new automated deicing facility and gate system, which went live in December 2020, coordinates all of ORD's deicing resources with a single point of control and analysis. Moreover, it provides instantaneous data to inform real-time decision-making and also archives real-time operational data for up-to-date analysis that facilitates planning.

The new system leverages a combination of deicing technologies from JCAI Inc. (JCAI), primarily an enterprise resource planning platform hub and a traffic management and process treatment platform. The system connects United, American and Integrated Deicing Services, which are all housed in the same control tower.

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Pilots use an iPad app to interact with deicing personnel on the ground.

Jeff Campbell, president of JCAI, says the initiative represents an opportunity for ORD to achieve economic sustainability and maximum profitability in all weather conditions while also benefiting the airlines' global operations.

A Long Wish List

Campbell credits the Chicago Department of Aviation and ORD airlines for pushing his company to create the patented one-of-a-kind system. "O'Hare had unique and sophisticated requirements, and they really stretched us to meet this challenge," he says. "They were extremely competent and knowledgeable, and they knew what they wanted."

Michael Fox, United Airline's managing director of Station Ops Control at ORD, emphasizes the need to balance safety while maximizing the facility's throughput. "Specific attention was given to automating the safe and efficient transit and parking of aircraft, allocations of deicing bays and critical CDF [centralized deicing facility] tower-to-pilot communications," Fox specifies.



JEFF CAMPBELL



MICHAEL FOX

Another instrumental player during planning was Franco Tedeschi, American Airlines' vice president for Chicago, Europe and Asia Pacific. "From the beginning of our partnership, JCAI has been receptive to our needs as an airline, and they have delivered infrastructure according to those detailed requests," says Tedeschi. "Together, we created an industry-leading deicing system for American, specific to Chicago, which extended to include a partnership with the city of Chicago and the utilization of the central deicing facility."



FRANCO TEDESCHI

Gene Herrick, American's deicing manager at ORD, says that the wish list his team developed included increased automation, in-ground lighting, fluid collection, record keeping capabilities and a system to monitor the deicing process live. The common theme for all the requests was increasing safety and decreasing delays.



GENE HERRICK

Kelvin Williamson, chief operating officer of JCAI, says the new system provides all that and more. "It gives the airlines, the airport and service providers an accurate and transparent window of data recorded for review, auditing and training," he comments.



KELVIN WILLIAMSON

After a series of strategic meetings augmented by scenario modeling and validation testing, the development team opted for a software and operational control system powered by SmartPad and Icelink.

SmartPad is a surface guidance system powered by pad-management software that is designed for user-friendly operation. Its electronic message boards and inset lighting provide clear

visual commands that guide aircraft into place for deicing and reduce the need for radio communications to mitigate the risk of miscommunication. The system's surveillance and metering features allow remote management and provide real-time graphic representation of activity at the deicing pad.

Icelink is a web-based deicing management system that provides real-time operational data to the airlines, the airport, deicing service providers and other pertinent stakeholders. Pilots use an iPad app to interact with deicing personnel on the ground, and all transactions are recorded and time stamped so data can be leveraged for planning, training and auditing.

The integrated system allows the airlines and the contracted deicing provider at ORD to keep tabs on their resources—even remotely via a smartphone app. The increased functional visibility helps the airlines measure key performance indicators to properly manage operations and control costs.

Tech at Every Turn

Aircraft move through the new facility much like patients move through a hospital triage system. A specific deicing protocol is initiated for each aircraft based on equipment type, route, weather conditions and historical data.

For pilots, using the facility is similar to driving through an automatic carwash. Lights and electronic message boards guide each pilot into a specific deicing pad. Once an aircraft is at the centerline, the system scans aircraft and guides the pilot to the park position. Commands are sent through the pad manager to the electronic message boards and are confirmed by pilots via radio or Icelight flight, an iPad flight deck tool.

While an aircraft is in the bay, the deicing truck operator takes control from dispatch and completes the deicing treatment assigned through Icelink. After the treatment is complete, control is transitioned from the deicer back to the controller. The pilot then receives guidance via the electronic message boards and flight deck tool that treatment is complete and it's safe to exit.

When deicing at the gate makes more sense, the system coordinates that, too. Campbell notes that American, United and Integrated Deicing Services still have full control and visibility over the entire operation to ensure that the right truck with the right inventory and personnel arrive at the correct scheduled flight.

On an airport-wide level, a live dashboard gives management personnel a real-time window into operations, thus arming them with information to make important decisions in real time based on developing trends in the operation.



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The new automated deicing system went live in December 2020.

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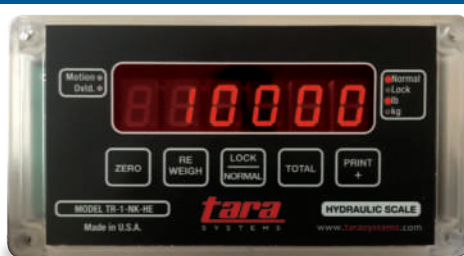
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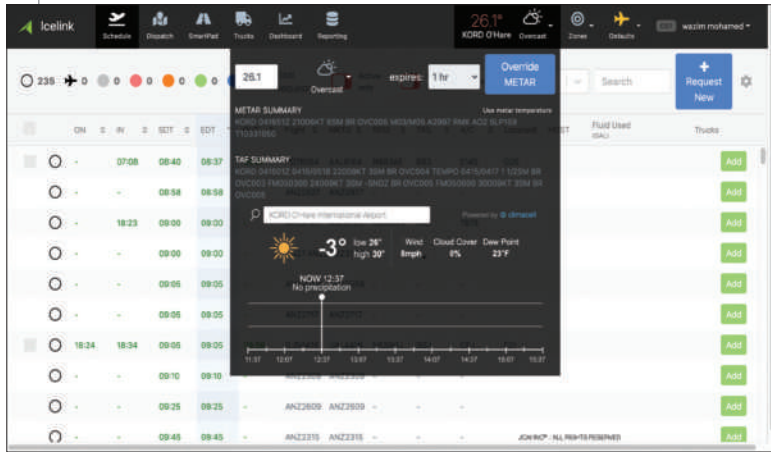
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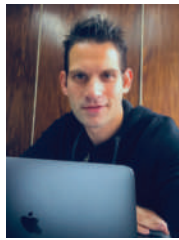
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Real-time data enhances coordination among pilots, controllers, deicing crews and airport personnel.

The project team hired research and consulting firm Frost & Sullivan to provide a third-party evaluation of the system's performance, and feedback was notably positive. Jonathan Norman, the firm's global head of airports and airlines, was struck by how the facility manages to make a complex process simple for everyone involved. He was similarly impressed with the meaningful data it supplies.



JONATHAN NORMAN

He was more impressed, however, with the collaboration among American, United and Integrated Deicing Services.

Even though Norman predicts that the system JCAI has created at ORD will disrupt the global deicing industry, he still considers the cooperation exhibited to be the real headline. "The uniqueness of the audit that I did was how the stakeholders managed to work together," he emphasizes.

Norman still remembers Tedeschi's philosophy on everyday airport operations— that once passengers enter the terminal,

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Pilot Requesting: Kelvin Williamson

Flight Number: UAL0349

Registraton: N68817

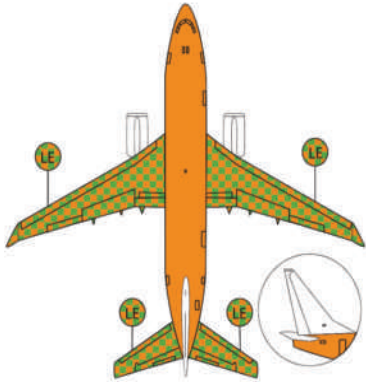
OAT: 71.1°F, 21.7°C

Service Location: C25

HOT Start: 11:16:20

Trucks Safe: YES

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Exit

they've already made their choice businesswise. Beyond the terminal doors, everything is about health and safety.

"That mentality takes the concept of operations to a whole new level," he reflects. "Everyone is working together in the same room. This collaboration and cooperation that you have at ORD, this doesn't normally happen in aviation; but it's where the industry *should* be."

The collaboration during deicing operations is evident in the system's very structure. One controller works inbound aircraft and another controls outbound aircraft. Herrick, from American, notes that controller duties rotate daily between personnel from American and United so both staffs are familiar with each position and the entire process.

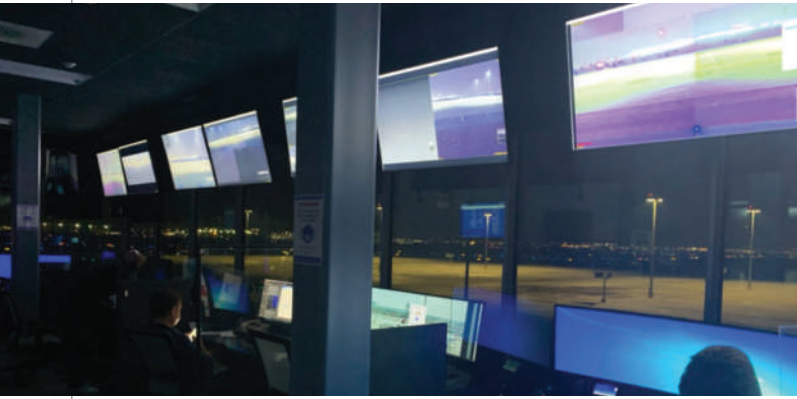
United's Fox adds that having a common JCAI platform between United and American provides a highly efficient operating structure for aircraft movement. "The unified approach to surface movement also extends to the FAA Air Traffic team

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Personnel from United and American rotate duties in the deicing control tower.

at ORD, creating a strong level of trust and partnership in tackling the complexities of one of the world's busiest airports," he adds.

Both of the airline representatives report that a significant level of coordination occurs in the centralized deicing facility control room.

Increasing Data, Decreasing Delays

When it comes to winter operations, every minute counts. Stopping the domino effect of flight delays can save huge amounts of overhead for airlines.

Herrick says that the new centralized deicing facility at ORD helps American and other carriers capture data and meter aircraft through the deicing process more efficiently to keep flights on schedule. "We've seen the speeds pick up out there without sacrificing safety," he reports.

He also notes that radio traffic—between flight crews and deicers, and between deicers and the control center—has decreased about 75%, creating a less stressful and less confusing work environment.

For Fox, the focus is on safety and the ability to increase gate utilization. "The CDF [centralized deicing facility] has delivered greatly, easing the congestion and pressure a winter operations environment typically creates in and around the terminals," he explains. "The efficient taxi flows now available for aircraft, especially those arriving with connecting customers, has been a game-changer from the CDF's inception. As the facility evolves, we expect longer-term benefits in deice truck utilizations, glycol fluid management and all-important flight throughput capacity gains."

The system's dedicated lighting systems allow snow removal crews to skip several clearing cycles at the deicing pad and focus on taxiways and runways. Even with several inches of snow on the pad, lights still guide pilots into the facility and sensors determine the aircraft type to initiate the associated deicing protocol.

In addition to facilitating ground operations at ORD, data gathered by the deicing system has global implications for carriers.

"Our airline is dependent on supporting a network, and in Chicago, we are one of the airline's key strategic hubs," Tedeschi says. "So it's important that we're able to indicate real-time performance metrics, especially during cold weather operations, to evaluate how the airline

is performing. Technology that allows operational visibility to any remote location—like our Integrated Operations Center in Dallas/Fort Worth, for example—allows the airline to see what's happening in Chicago and plan strategically and accordingly. That ensures that we plan for the sequence of arrivals and departures, protect connectivity and maintain operational excellence while upholding safety and compliance in the deicing process."

Rather than arbitrarily cancelling flights, airlines can select which specific flights make the most sense to cancel—economically and from a customer service point of view. "Airlines and airports today are operating in very tight margins, and they have responsibilities to customer rights," Campbell comments. "Those things dictate the need for an operation that's extremely precise and efficient."

The precision and visibility of deicing operations at ORD are key for Fox, because they provide a solid foundation for United's station operations control and network operations control to execute critical operational decisions for both the airline and its customers. "As a key hub, many of the aircraft treated at the CDF not only flow back to ORD but also throughout our expansive network," he says. "Clear visibility on performance during a winter event adds a level of accuracy and precision to our strategic planning and tactical execution."

Elusive Global Standards

Mike Hume, vice president of business development for JCAI, stresses the importance of consistent deicing standards throughout the world. "If you go to one airport, then you go to another airport, it should be like going to a McDonald's. If you get a Big Mac, you know what to expect. And with this system, the pilot knows what to expect," says Hume. Consistency is especially important for pilots who don't operate in winter weather conditions often enough to become proficient in deicing requirements, he adds.

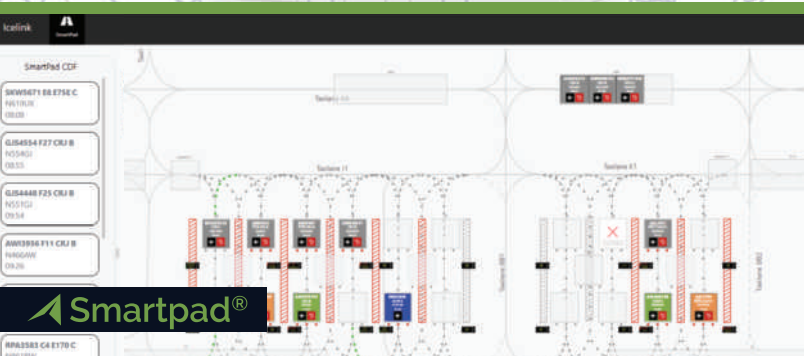
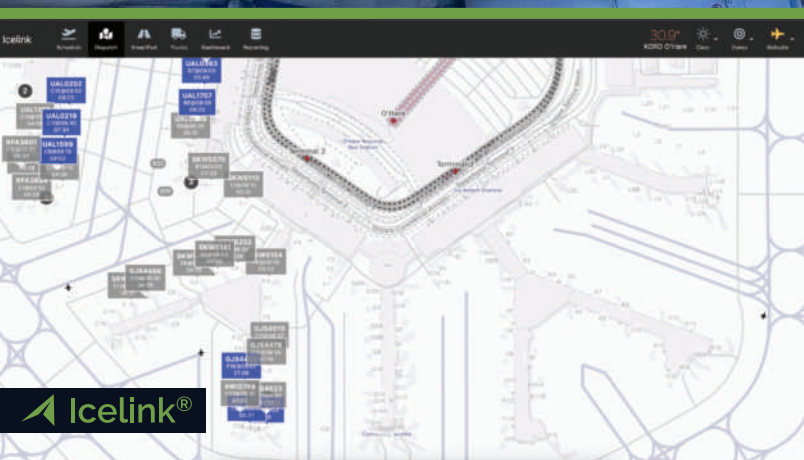
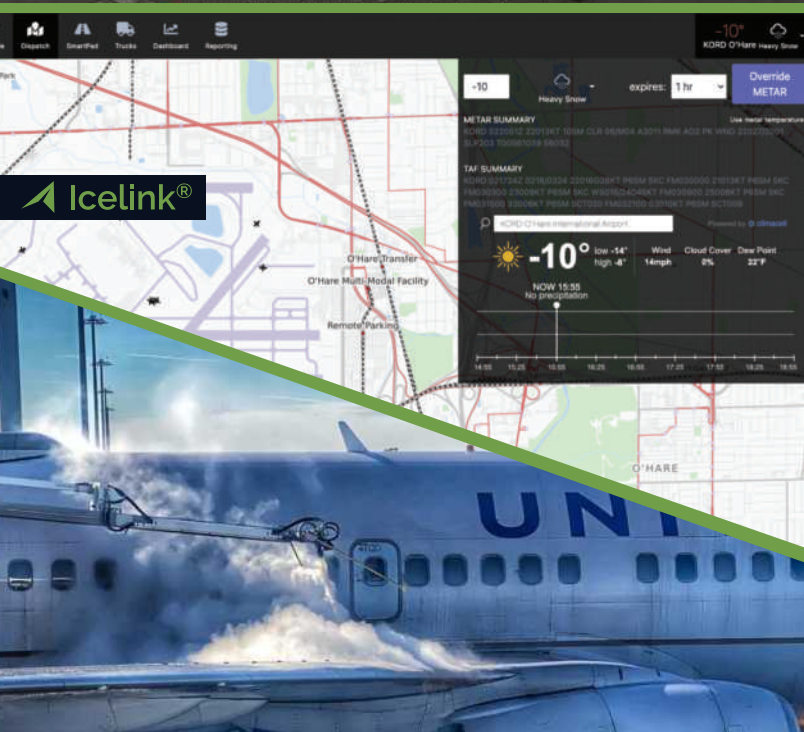


MIKE HUME

Achieving consensus, however, is a tall order. JCAI executives have watched eight committees of the SAE G-12 Aircraft Ground Deicing Steering Group work diligently to develop global standards for nearly three decades. Williamson points to pilots flying from Frankfurt to Toronto to New York as a prime example. "It makes their job a lot easier and a lot safer if everybody is working off the same standards," he says. "What the Icelink platform and SmartPad have done is helped achieve that global standardization."

As more cold weather airports add centralized deicing facilities and follow global environmental practices, Fox predicts that the adoption of universal standards for aircraft deicing could lead to significant returns on investment for operational efficiencies. "This is inclusive of throughput goals, flight crew procedures and, most critically, ensuring the highest levels of safety for ground personnel, flight crews and the strict adherence to the Clean Aircraft Concept," he says.

The new system at ORD is a substantial step toward standardization. "We're really proud of the work that's gone in, by both the airlines and the city of Chicago," says Herrick. "We're seeing the amazing things that we're able to do that we had only dreamed of before." ✈️



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