

Airport De-Icing Operation A Study In Safety & Environmental Soundness

What happens when winter passenger safety and environmental protection meet at an airport? In the case of Bradley International Airport, both sides are very well looked after.

It is a long-established safety practice that an aircraft with snow or ice on the wings is de-iced before take off. Aircraft De-icing Fluid, made up mainly of a chemical called glycol, is a freeze-point suppressant that is very effective in removing snow or ice build-up from aircraft surfaces.

"The attention paid to aircraft de-icing and safety is much deserved," said Dan Reynolds, environmental manager for Bradley International Airport. It is widely

known in the aircraft de-icing sector that NASA conducted research a number of years ago that showed that as little as 0.8 mm of ice on the leading edge of an aircraft wing can reduce lift by as much as 25%. The potential impact on aircraft controllability is huge and is borne out in crash statistics.

Once aircraft are cleaned of snow and ice, the chemical falls to the ground and is diluted by snow and rain. It then becomes an environmental issue. "Once the wings are clean, our focus changes from safety to the environment," said Reynolds. "Bradley has aggressive work procedures and well-developed infrastructure in place to prevent any of the glycol contaminated fluid from escaping to the surrounding environment," he adds.



All glycol contaminated fluid collected at Bradley is deposited to two, one-million gallon underground storage tanks. From these storage tanks, the material is piped to Inland Technologies' plant for recycling.

Two important aspects of this environmental program at Bradley are several specialized vacuum trucks to recover the material once it hits the ground and the airport's passive waste collection system. "A number of years ago the airport communi-

ty invested in developing a fluid collection system where all de-icing fluid effluent passively feeds into our underground storage tanks," explains Reynolds. "It's a big part of how we meet our environmental objectives."

The airport operates under a very strict plan with the State Department of Environmental Protection to eliminate contamination from stormwater discharges at the airport, including glycol-based aircraft de-icing fluid. "We operate



A technician runs a system check on Inland's Glycol Concentrator at Bradley. This patented system uses about one-tenth the energy of traditional distillation systems to separate water from the waste chemical.

under very tight environmental limits and have a detailed plan in place to make sure all waste aircraft de-icing chemical is contained, quickly collected, and then recycled," said Reynolds. "We're able to meet the environmental terms set out because of the cooperative working relationship between the airport, the airlines and the companies that provide de-icing services."

Because aircraft are de-iced during frozen precipitation events, the total volume of stormwater contaminated with spent aircraft de-icing fluid at Bradley varies between two to three million gallons each winter. Given the volume of fluid that must be managed, Bradley Airport made the decision a few years ago to recycle the material onsite. Since 2005, an environmental services company called Inland Technologies has been providing this service.

"Inland recycles two to three million gallons of wastewater at Bradley each winter," said Alan Mastendino, site operations manager for Inland Technologies at Bradley Airport. "Our recycling equipment separates the dilutant water from the

chemical and produces clean water that can be released directly to the local waste water treatment plant," he adds.

The basis of the recycling program at Bradley is Inland's patented Glycol Concentrator, equipment that is in use at airports across North America. "A dozen years ago Inland embarked on a research and development project that would help us solve the winter wastewater compliance issues faced by our airport customers," said Mastendino. "The Glycol Concentrator produces a cleaned industrial water and a concentrated glycol chemical product that is taken offsite, refined and reused," he adds. The recycled glycol makes it way into industrial markets and is reused as automotive coolant, heat transfer fluid, windshield wash fluid additive, and in mining applications.

Reynolds adds, "Until we come up with a way to get aircraft off the ground during snow events without de-icing, recycling our waste glycol allows us meet the environmental conditions set out by the regulators, protect our waterways, and reuse something that was once waste."



A de-icing operation on February 22, 2008 at Bradley Airport. Aircraft are de-iced as a matter of safety. NASA studies have shown that as little as 0.08 mm of ice on the leading edge of a wing can reduce lift by 25 percent during takeoff.

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