ACRP Problem No. 12-10-14

De/Anti-Icing Optimization Handbook For Small Airports

ACRP Staff Comments: No comments offered.

TRB Aviation Group Committees Comments: ENVIRONMENTAL IMPACTS OF AVIATION CMTE - Support. Recommendation is predicated upon the study being focused on reducing the environmental impacts from deicing operations at small airports, and not optimizing deicing operations. The proposed budget seems excessive because most of the effort would be to pull information from various sources including existing ACRP reports (e.g., Report 14: Deicing Planning Guidelines and Practices for Stormwater Management Systems) and evaluate the information for applicability to small airports.

Review Panel Comments: Not recommended — Guidance can't be prepared before the EPA issues its ruling on ELGs

AOC Disposition: No funds allocated. No discussion.
RESEARCH PROBLEM STATEMENT:

Aviation regulations prohibit the takeoff of aircraft when snow, ice or frost is adhering to wings, tails, control surfaces, propellers, engine intakes and other critical surfaces of the aircraft. This rule forms the basis of the “Clean Aircraft Concept”. To this end, the aviation industry has developed ground de/anti-icing procedures and technologies to maintain the safety of winter flight operations. The technologies most prominently used for aircraft ground de/anti-icing are glycol-based freeze point depressant fluids.

A sizeable amount of de/anti-icing research and development has been conducted by regulators and the global aviation industry in recent years, resulting in the dramatic improvement in the quality of aircraft de/anti-icing fluids, holdover time guidance material, fluid delivery equipment, fluid recovery equipment, industry procedures and ground/flight crew training.

At large airports, air carriers and service providers maintain significant infrastructures to ensure launch capability of aircraft in wintertime precipitation conditions and sophisticated environmental control systems are often in place. De/anti-icing crews at large airports impacted by winter weather are typically well trained, well managed, well equipped and proficient, and de/anti-icing optimization technologies and procedures, such as proportional blending of Type I fluids, can be readily employed to streamline the costs and impacts of the operation. At smaller airports, however, de/anti-icing infrastructure tends to be less specialized and abundant, and deficiencies in equipment, fluids, quality control, personnel, training, proficiency and environmental controls are often the norm.

At the present time, there is an urgent need for guidance to assist small airports in the development and implementation of scaled-down de/anti-icing solutions that are tailored to the operational, economic and environmental requirements of the airports. This need has been identified at numerous industry meetings and conferences, and there is general agreement amongst industry experts that de/anti-icing operations at large airports are far less problematic from a safety perspective than those at smaller airports.
OBJECTIVES:

The research project will examine the current state of de/anti-icing operations at small airports and will produce a handbook to guide airports, air carriers and service providers in the development and implementation of safe, cost-effective, operationally efficient and environmentally compliant de/anti-icing solutions for small airport applications.

RESEARCH PROPOSED:

The proposed research will be performed in two Phases:

- **Phase I** would research, document and analyze the current state of de/anti-icing operations at small (general aviation, commuter, regional) airports, leading to a comprehensive understanding of the variables, challenges and obstacles affecting small airport de/anti-icing operations; and

- **Phase II** would produce a handbook to guide airports, air carriers and service providers in the development and implementation of safe, cost-effective, operationally efficient and environmentally compliant de/anti-icing solutions for small airport applications.

ESTIMATE OF THE PROBLEM FUNDING AND RESEARCH PERIOD:

The Recommended Funding for the research project described herein would be in the range of $200,000 to $300,000. The Recommended Research Period would be in the range of 15 to 18 months, and would include at least one winter season to enable site visits to selected airports.

URGENCY AND PAYOFF PERIOD:

There is an urgent need to assist small airports in the conduct of de/anti-icing operations. In recent years, the trend of occurrence of aircraft ground de/anti-icing related accidents/incidents has shifted away from large hub airports with sophisticated de/anti-icing infrastructure and has become far more prevalent in smaller operations. De/anti-icing infrastructure at small airports is often marginal or non-existent, and operations are often geared toward ensuring bare minimum compliance with regulatory and environmental requirements, if at all.

Ground de/anti-icing research and development has been an area of strong industry focus in recent years, and numerous off-the-shelf de/anti-icing optimization technologies and procedures exist. Many of these optimized practices, in addition to the historical de/anti-icing methodologies, may be scaled down to suit the needs of small operations.

For all the reasons identified herein, it is anticipated that the payoff period for application of the results of this research project would be immediate.

RELATED RESEARCH:

Research on de/anti-icing optimization practices was recently performed as part of ACRP 10-01, Optimizing the Use of aircraft Deicing and Anti-Icing Fluids. In addition, ACRP 02-02,
Managing Runoff From Aircraft and Airfield Deicing and Anti-Icing Operations, produced Best Management Practice (BMP) Fact Sheets related to ground de/anti-icing practices, especially as they pertain to runoff management.

A sizeable body of aircraft ground de/anti-icing research and development has also been funded by Transport Canada and the Federal Aviation Administration since the early nineties. This research, which has resulted in a dramatic improvement in the safety of de/anti-icing operations conducted worldwide, has never specifically targeted de/anti-icing operations at small airports.

PERSON(S) DEVELOPING THE PROBLEM:

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PROCESS USED TO DEVELOP THE PROBLEM STATEMENT:

The Problem Statement contained herein was developed by John D’Avirro, APS Aviation Inc., in response to general needs often identified within industry conferences and committee meetings, in particular the Society of Automotive Engineers (SAE) annual SAE G-12 Deicing Committee meetings.

DATE AND SUBMITTED BY:

This Problem statement was submitted by John D’Avirro on March 4, 2011.