Deicing Challenges & Solutions

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ASC/WWME
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Deicing Challenges & Solutions

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This keynote speech will consist of a general overview of U.S. military’s recent efforts to develop new aircraft and runway deicing technologies that will reduce impact on ecosystems; issues and challenges the military has faced in this area; teaming arrangements formed to effectively meet these challenges; and environmental, operational and safety drivers impacting military deicing operations. Over the past several years, the environmental and operational issues associated with deicing activities at Air Force facilities worldwide have increased substantially. While maintaining compliance with continually changing environmental legislation, new technologies must also be compatible with weapon systems, infrastructure, and airfields and meet the warfighters’ deicing and anti-icing performance requirements. Weapon system single managers, operational wings, and installation commanders are all stakeholders protecting their weapon system assets and local infrastructure under snow and ice conditions that require deicing and anti-icing actions. Above all, safety is a fundamental tenet of all military flying operations. Working groups and periodic workshops have enhanced communication and as a result, increased the effectiveness of the military to identify deicing related issues and develop coordinated approaches to pursue new technologies and procedures.
KEYNOTE ADDRESS
DEICING CHALLENGES/SOLUTIONS

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Flight departure is delayed ... Plane needs to be deiced

What? There is nothing on the plane! Where is global warming?
Deicing is **NOT** licking the icing off a cake!

*When airport maintenance workers take their work home with them*
Aviation deicing has come a long way!
Safety

Increases weight & drag on aircraft
Reduces friction on runways
Environmental

• Primary Regulation: Clean Water Act
• Concerns: Biological Oxygen Demand, Toxicity
• Requires permitting, collection, treatment, etc.
Materials Compatibility

Corrosion on cadmium plated component, electrical connector exposed to potassium acetate.
Operational
Rain or shine, sleet or snow...the military will deliver!
Training

Deicing/anti-icing operations are not simple!
Aeronautical Enterprise Deicing Working Group

- Members/Associates: Air Force, Army, Navy, FAA, OEMs, Canadian DND

- Networking with SAE G-12, SAE G-15, Industry

- Addressing challenges while pursuing new technologies......
Aeronautical Enterprise Deicing Working Group

• *Primary Objectives:*
  – Single technology for runways and aircraft
  – Reduce environmental impact
  – High performance deicer
  – Nonchemical, portable aircraft deicer
Aircraft Deicing Trucks

Easier to prevent fluid overspray with enclosed cab

Safer deicing with extended reach for stabilizers

65 ft (19.8 m)
Aircraft Deicing Truck Nozzle System

Two Nozzles:

- Fluid only
- Forced air only
- Fluid over air
- Fluid injection

Global ER-2875 Platform
Aircraft Deicing/Anti-icing Fluids

- Fluid demonstrations completed (ESTCP)
- Demonstration planned Jan - Feb 2011 (ESTCP)
- Deicing/anti-icing fluid R & D underway (SERDP)
Corrosion Damage From Runway Deicing Materials

Deicing Material Compatibility Tests completed for military materials

DoD Deicing Joint Test Protocol developed
Runway Deicing Fluids

Less corrosive runway deicing fluid demo (SERDP/ESTCP)
Infrared/Radiant Energy
Portable Unit Concepts

Truck mounted heater unit

Deployable heater unit
Radiant Energy
Fixed Radiant Energy Deicing Facility
Ice Detection Camera

- Ice detection on aircraft is visual or tactile
- Camera would enhance safety and reduce fluid
- Demonstration being pursued
Ice Phobic Materials

- Prevent formation of ice on surface
- Development efforts underway

Freezer tests measure adhesion of frozen water drops
Additional Potential Solutions

• Achieve extensive use of aircraft anti-icing fluids

• Use Airfield Environmental Monitoring Tool at bases (ESTCP)

• Microbe evaluation planned for Maine ANGB, Bangor, ME
Summary

• **Deicing has many challenges**
  – Reduce environmental impact
  – Enhance safety
  – Optimize operational envelope
  – Reduce cost from damage to airframe and runway

• **Stakeholders will continue to work toward solutions to these challenges!**
Thank You!