

Deicing Challenges & Solutions



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ASC/WWME

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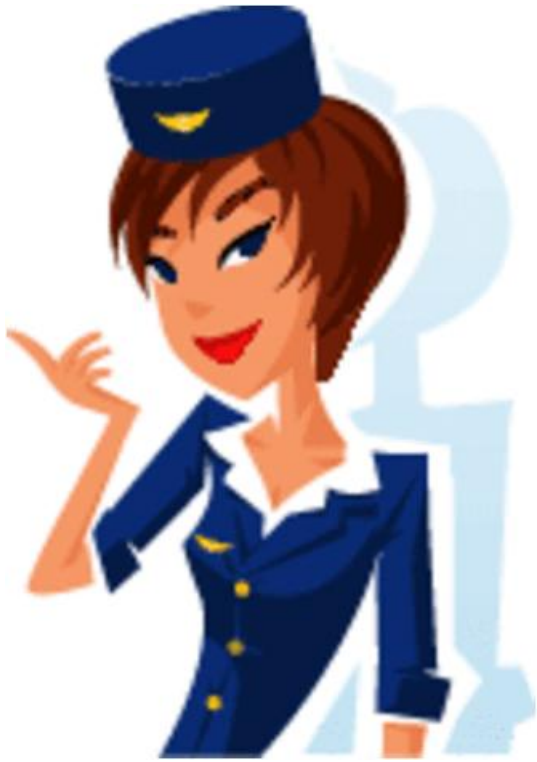
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KEYNOTE ADDRESS
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Flight departure is delayed ... Plane needs to be deiced

What? There is nothing on the plane! Where is global warming?



Deicing is
NOT
licking
the
icing off
a cake!



Aviation deicing has come a long way!



Safety

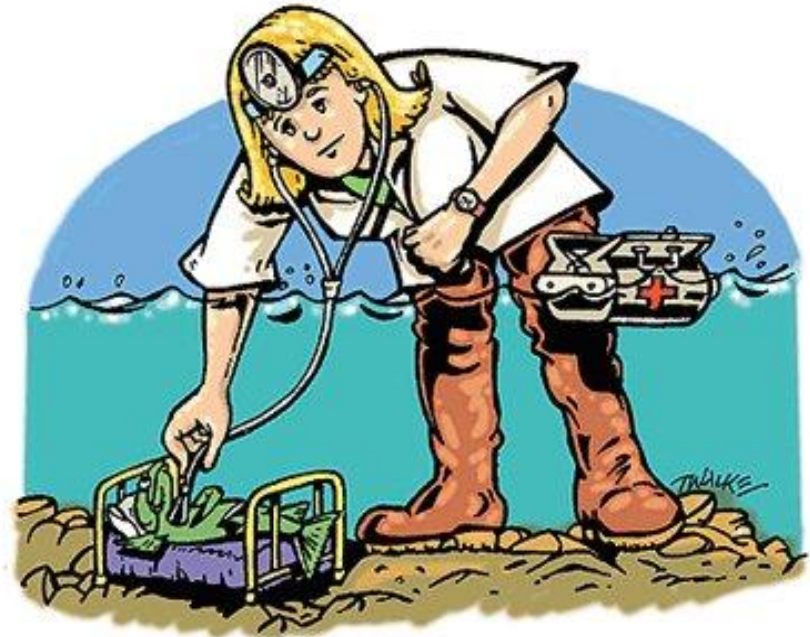


Increases weight & drag on aircraft

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

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*Nonchemical,
portable
deicer*

Aircraft Deicing Trucks

**Easier to prevent
fluid overspray
with enclosed cab**



**Safer deicing
with extended
reach for
stabilizers**

Aircraft Deicing Truck Nozzle System



Fluid only

Forced air only

Fluid over air

Fluid injection

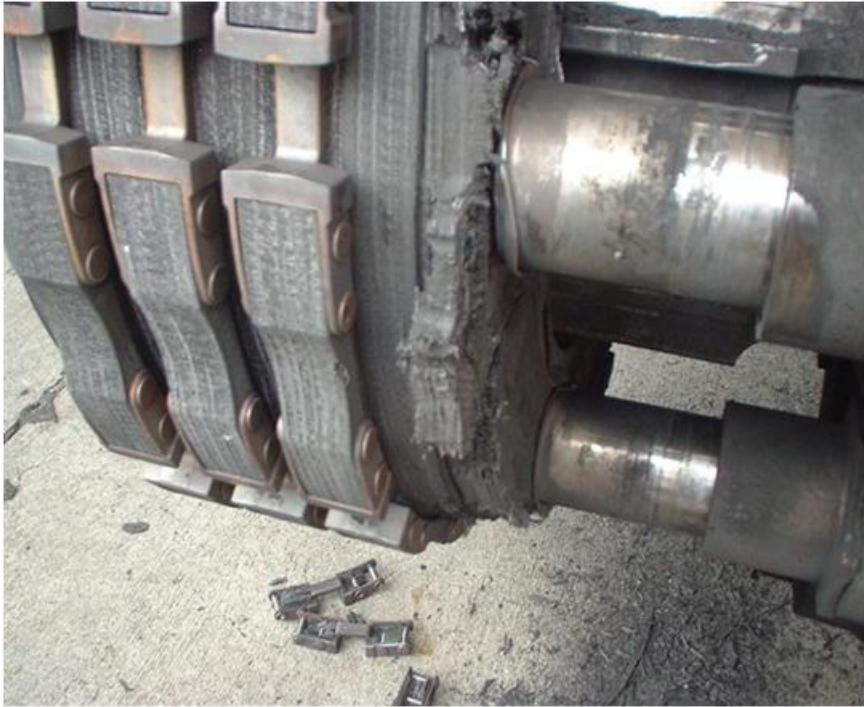


Aircraft Deicing/Anti-icing Fluids



- **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

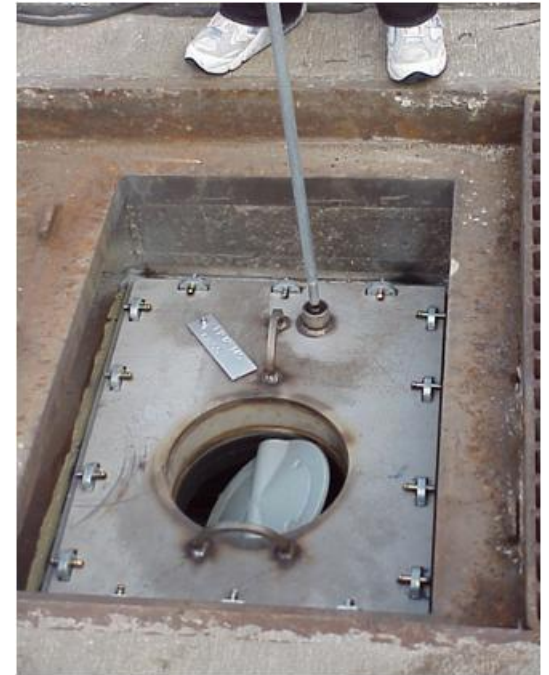
**Less
corrosive
runway
deicing
fluid
demo
(SERDP/ESTCP)**



Deicing Fluid Cleanup/Collection



**Glycol
recovery
vehicles**



**Storm
drain
insert**

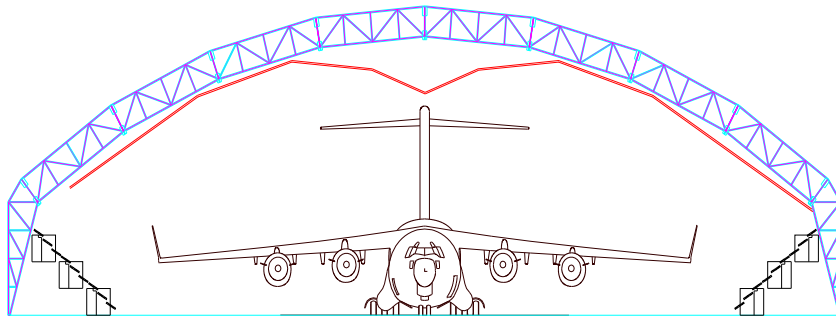


Infrared/Radiant Energy

Portable Unit Concepts



Truck mounted heater unit



Deployable heater unit

Radiant Energy

Fixed Radiant Energy Deicing Facility



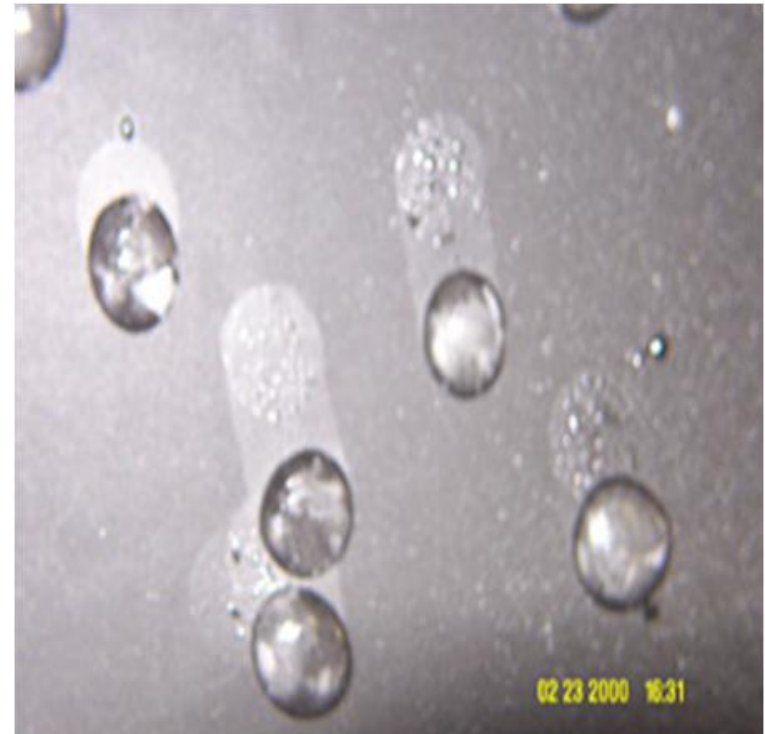
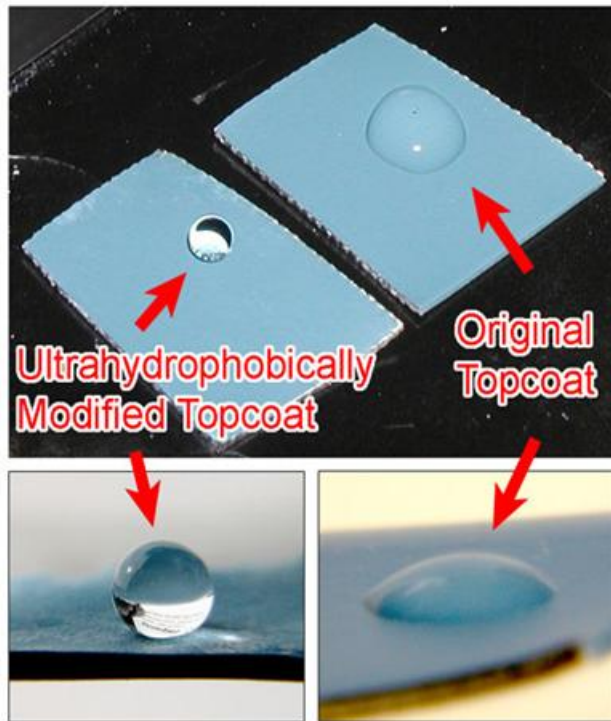
Ice Detection Camera



- **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!**

