

Aircraft Icing Research Alliance

Perspectives and Visions

Presented to: AIRA

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Federal Aviation
Administration



Outline

- **Introduction**
- **Global thinking**
- **Icing research for aviation safety**
- **Conclusions**



Introduction

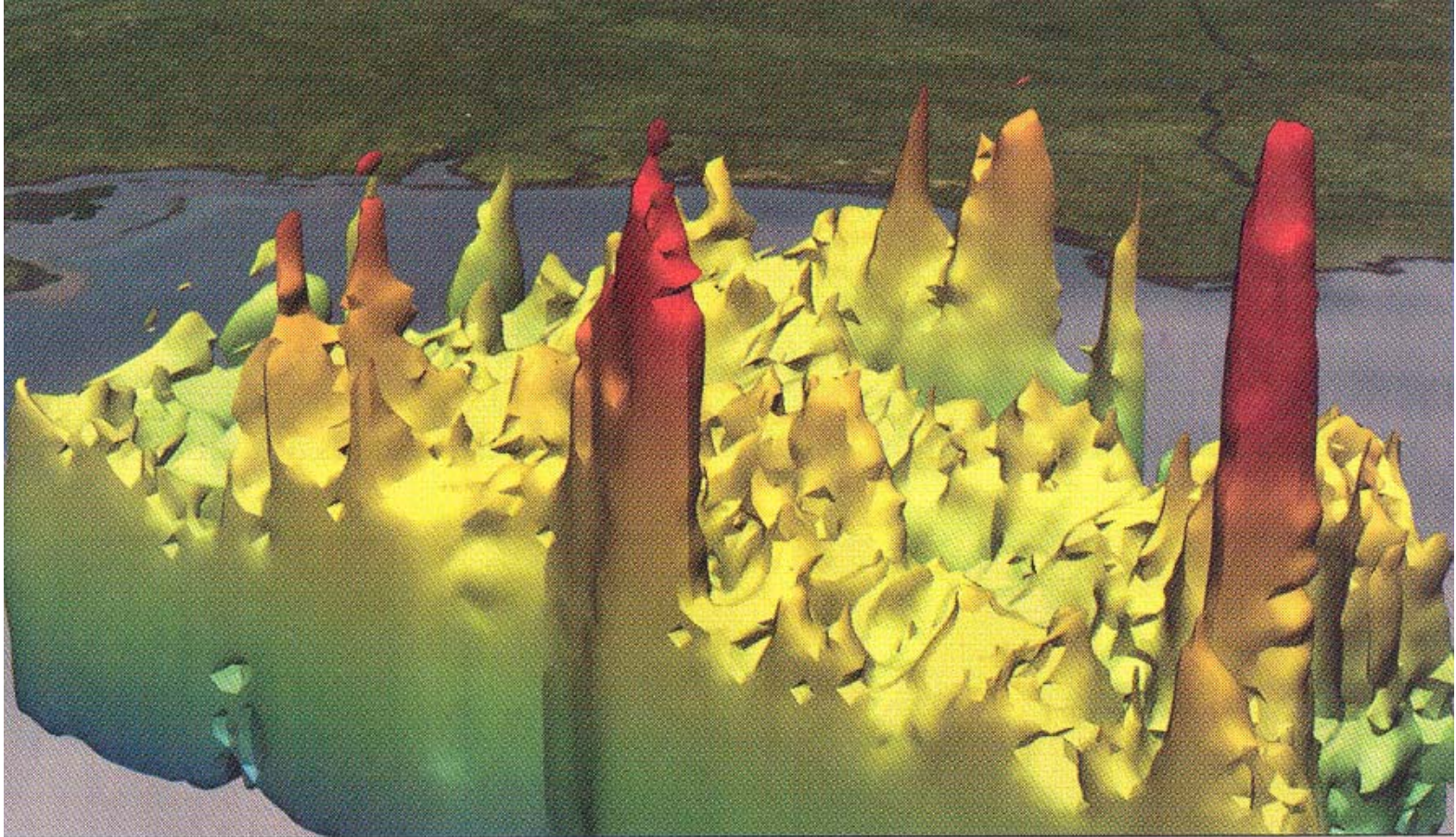
- **Romanced by airplanes.**
- **What has changed over 46 years.**



Technology of the 1960s



21st Century Technology



Global Thinking

- **Roles of “technocrats” in resolving global issues:**
 - Global problems are people issues and solutions.
 - The role of intellectual resources
 - Resolution of global problems through effective management of intellectual and material resources.

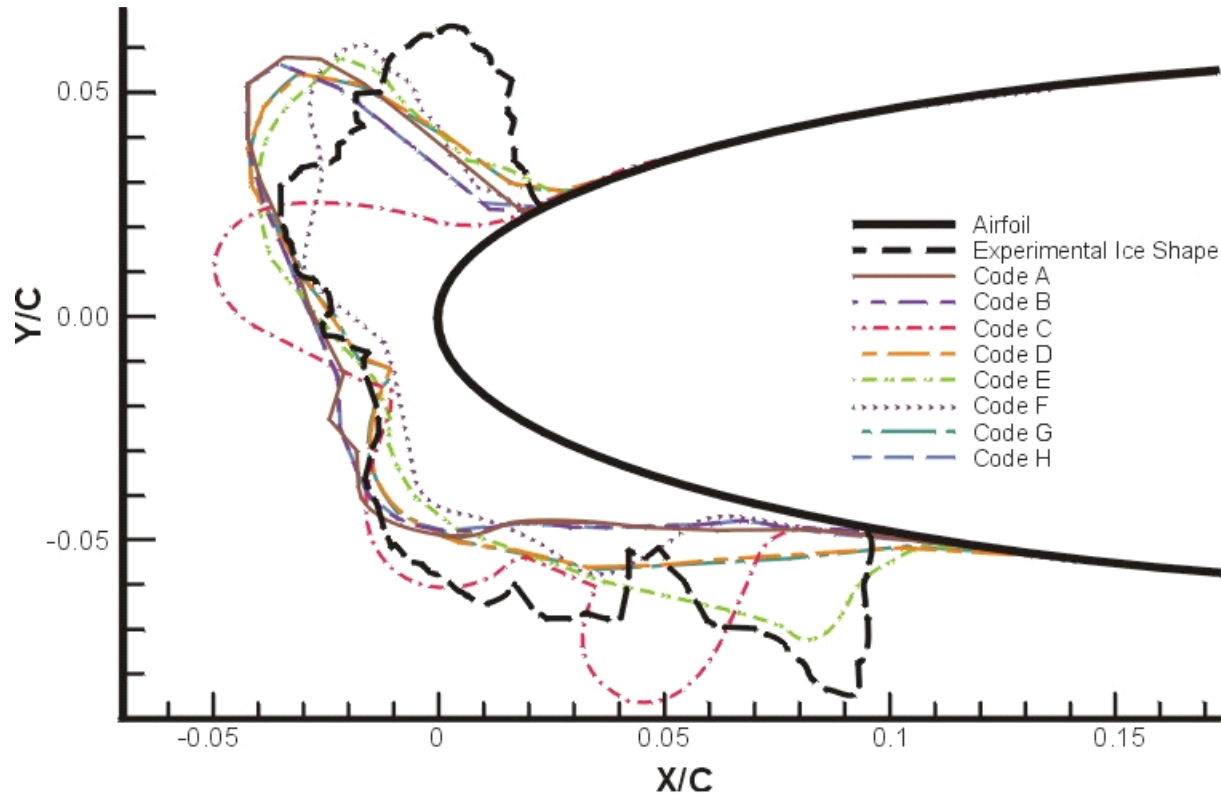
Icing Research for Aviation Safety

- **Endorsement of recommendations made last year by Frank Lynch.**
- **Visions:**
 - Equivalent safety records for clear-air and icing flight operations.
 - Development of low-cost coupled autopilots for small regional/commuter air transports.
 - Use of liquid water content and drop size to define icing intensities by the National Weather Service.
 - Advance ice protection systems.
 - Elimination of natural flight testing through use of validated icing simulation methods.
 - Comprehensive icing conditions standard.
 - Training media for atmospheric icing training media.

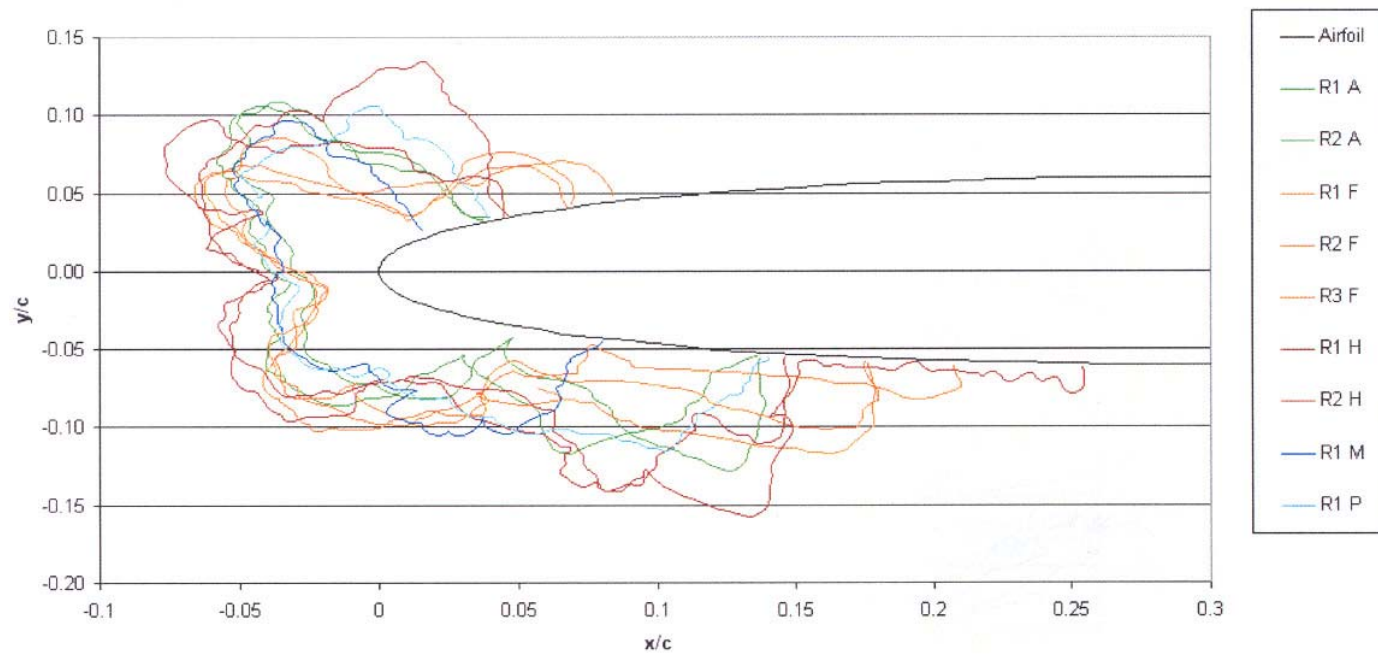
Need for Advanced Ice Protection Systems



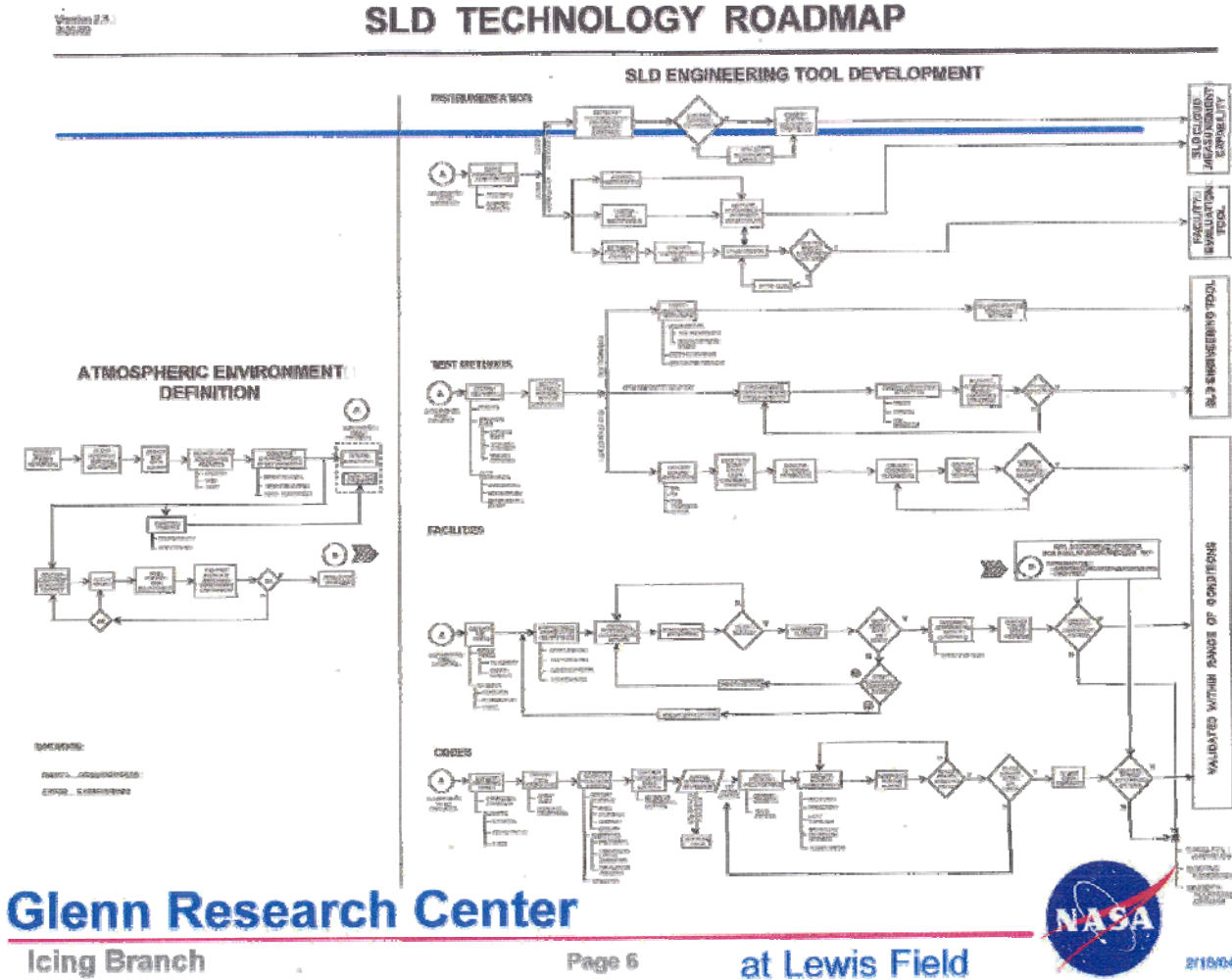
Validated Icing Simulation Methods – Ice Accretion Computer Codes



Validated Icing Simulation Methods – Icing Wind Tunnels



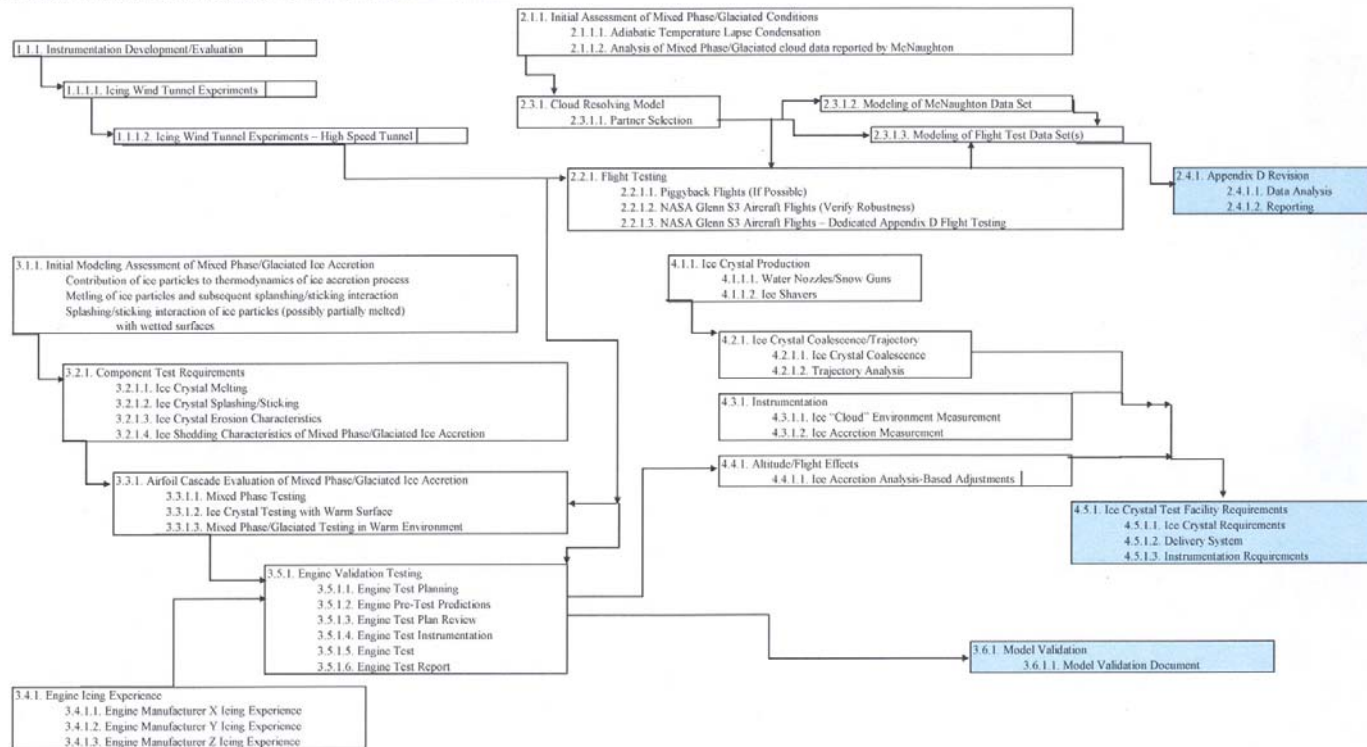
Comprehensive Icing Conditions Standard – SLD



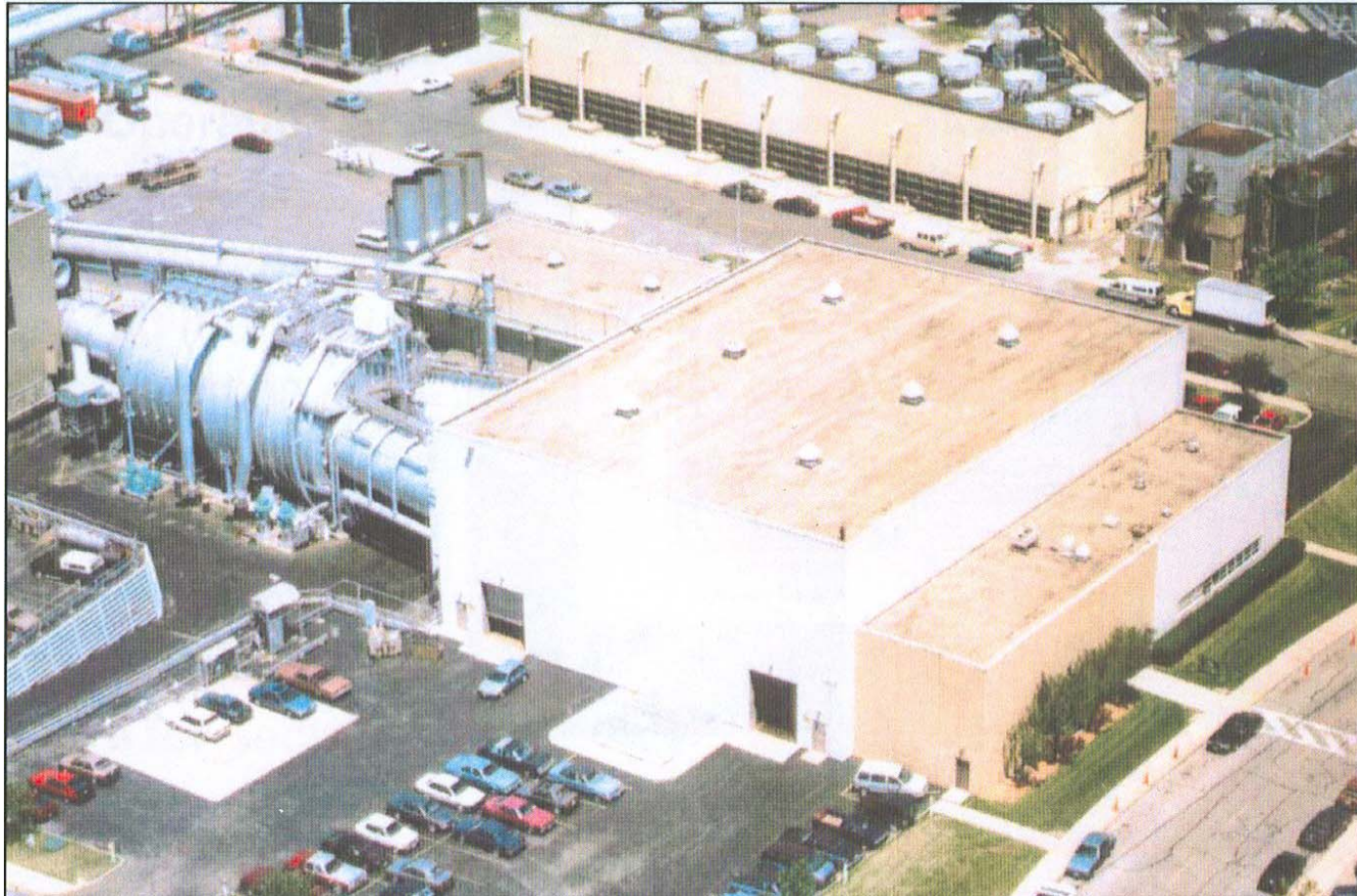
Comprehensive Icing Conditions Standard – Mixed-phase and Glaciated Conditions

Appendix I. Technology Roadmaps by Task

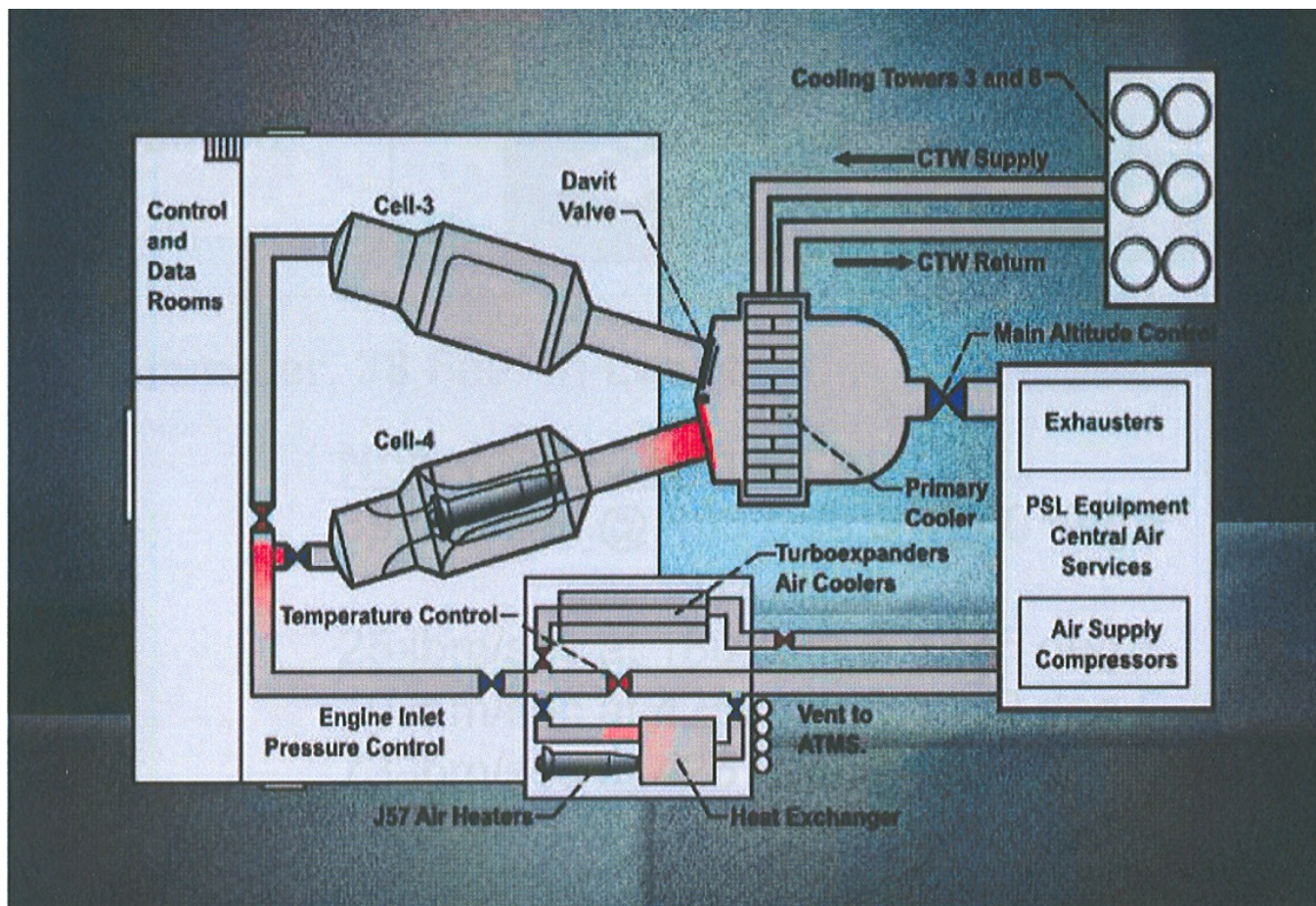
- Task 1. - Instrumentation development and evaluation for high ice water content
 Task 2. - Flight test research for characterization of high ice water content environments.
 Task 3. - Experimental testing in support of ice accretion model development and validation for high ice water content environments.
 Task 4. - Test Facilities Requirements for demonstrating engine compliance with Appendix D requirements.



Comprehensive Icing Conditions Standard – Simulation of Mixed-phase and Glaciated Conditions For Engine Icing Physics



Comprehensive Icing Conditions Standard – Simulation of Mixed-phase and Glaciated Conditions For Engine Icing Physics (Contd.)



Conclusions

- **Collaborative research is required to make the vision of safe operations in atmospheric icing real.**
- **AIRA's mission supports the vision of safe aircraft operations in icing.**
- **Organizations having the goal of safe aircraft operations in icing would benefit by participating in AIRA.**

