JOINT ADVANCED MATERIALS & STRUCTURES CENTER OF EXCELLENCE

Introduction to FAA Research

JAMS Fourth Annual Technical Meeting
June 17, 2008

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A Center of Excellence
AMTAS
Advanced Materials in Transport Aircraft Structures

CECAM
center of excellence for composites and advanced materials

Topics

- FAA Research
- JAMS Center of Excellence
- Logistics
- Technical Meeting Theme

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FAA Research Process

External Research Reviewers
REDAC
SAS
Aviation Industry

Program Areas

- Advanced Materials/Structural Safety
- Aging Aircraft/Continued Airworthiness Research
- Aircraft Catastrophic Failure Prevention
- Airport Research & Development
- Atmospheric Hazards
- Propulsion/Fuel Systems
- Fire Research & Safety
- Risk Analysis
- Flight Safety
- General Aviation /Vertical Flight (F&E)
- Unmanned Aerial Systems

Facilities

- Aircraft Components Fire Test Facility
- Air Flow Induction Test Facility
- Category I Reconfigurable Approach Lighting System Test Bed
- Chemistry and Material Sciences Laboratory
- Dynamic Vertical Drop Test Facility
- FAA Engine Nacelle Fire Simulator
- National Fire Extinguishing Agent
- Full-Scale Fire Test Facility
- Full-Scale Curved Panel Test System
- Materials Fire Test Facility
- National Pavement Test Facility
- Propulsion and Fuel Systems Test Facilities
- Runway Friction Laboratory
- Video Landing Loads Facility

FAA Advanced Materials Research for Safe Composites

Safety advancement in each key risk area depends on close integration with all

Environmental and Aging Effects

- Environmental effects
- Reliability assessment
- Aged Structure Destructive Evaluation

Standardization

- Shared Databases
- Test Methods
- Material and Process Control

1) Structural Substantiation and Damage Tolerance

- Advances in analysis & test building blocks
- Critical defects
- Fatigue & damage considerations
- Life assessments (tests & analysis)
- Manufacturing defects

Advanced Materials, Forms and Processes

- Braiding
- Stitching
- Liquid Resin Molding

CMH-17 (MIL-HDBK-17)

3) Composite Maintenance Practices

- Bonded structure & repair issues
- Accelerated testing
- Impact damage effects
- Quantitative NDE/service POD
- Equivalent levels of safety

Cabin Safety Unique to Composites

Fatigue & Damage Tolerance for Dynamic Composite Structural Applications

2) Structural Integrity of Bonded Joints

- Processing Issues
- Analysis Methods

Advanced Materials Research & Training Supporting FAA Needs

- Steps in the advancement of research

1) Research Project

2) Detailed Documentation

and background for

3) Rules, Policy and Guidance

4) Training

» In order for the research to have the greatest benefit, it should be adequately linked to:

1) FAA needs,
2) FAA groups establishing rules, policy or guidance
3) Certification projects,
4) Industry interface and, if appropriate,
5) New technology considerations

Areas Directly Supported by JAMS CoE

Other RPDs with Potential for JAMS Activities

- RPD 161 Structural Integrity of Commuters
- RPD 419 Turbine Engine Research*
- RPD 460 Aircraft Maintenance
- RPD 502 Aircraft Crashworthiness
- RPD 515 Transport Airplane Structural Integrity
- RPD 516 Aircraft Catastrophic Failure Prevention
- RPD 517 Fire Resistant Cabin Materials*
- RPD 519 Rotorcraft Structural Integrity and Safety
- RPD 556 Continued Airworthiness of Aircraft Engines*
- RPD 558 Fire Safety and Cabin Safety*
- RPD 584 Inspection Systems R&D
- RPD 678 Unmanned Aerial Systems

* These RPDs currently have a CoE or Consortium arrangement available

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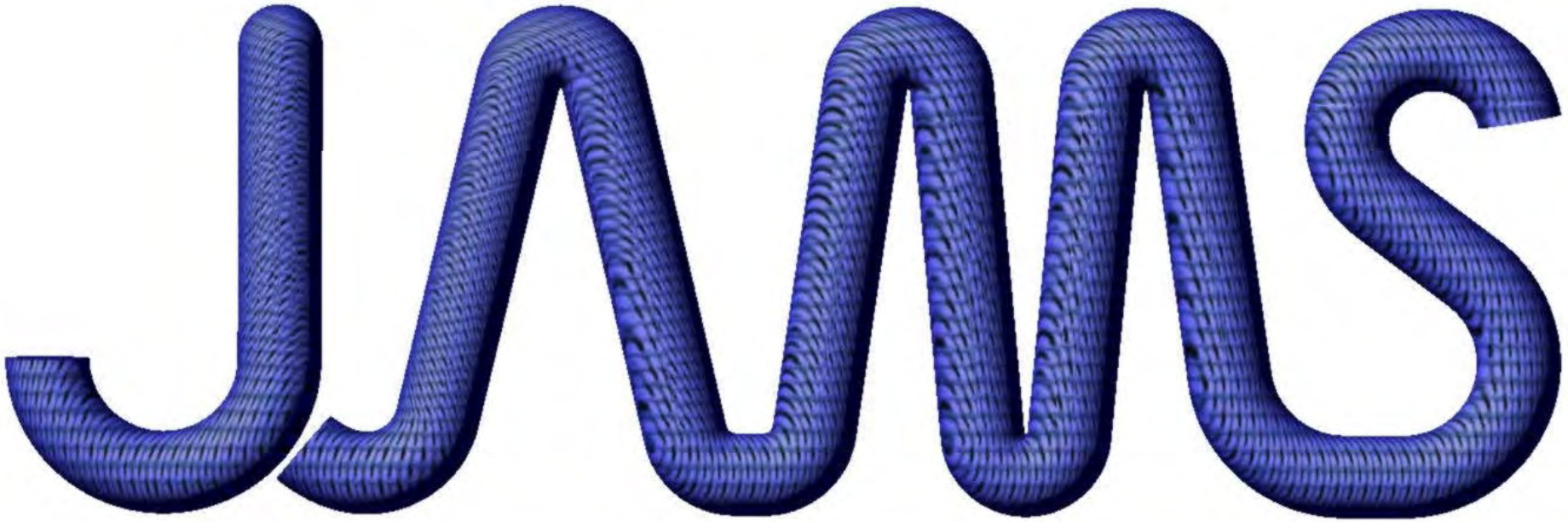

JOINT ADVANCED MATERIALS & STRUCTURES CENTER OF EXCELLENCE

Member Schools

- The joint center consists of two groups and includes twelve institutions
- AMTAS (Advanced Materials for Transport Aircraft Structures)

- CECAM (Center for Composite and Advanced Materials)

Common Project Initiatives

Apply across all technical focus areas

- Work with industry to study issues and validate design details, analysis procedures, materials and processes for advanced aircraft structure.
- Work with international standards organizations (e.g., ASTM, SAE P-17, CACRC, TTCP and MIL-HDBK-17) to establish engineering guidelines.
- Develop coursework and conduct workshops to train the workforce.

CoE Technical Focus Areas

- The technology areas addressed :
  - Structural Substantiation
  - Damage Tolerance and Durability
  - Bonded Joints Processing Issues
  - Maintenance Practices
  - Material Standardization and Shared Da
  - Advanced Material Forms and Processe
  - Cabin Safety and Crashworthiness
  - Life Management of Materials for Improved Aircraft Maintenance Practices
  - Nanotechnology for Structures

Transition to Phase II

- Was due to be completed in May 2008
- Evaluation on effectiveness of the CoE has been performed
- Minor changes were proposed for the structure which have been incorporated
- Additional institutions were added to membership
- Delay in getting agreements signed with some schools has changed the expected completion date to later this year

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Logistics

- Restrooms are just outside of the doors left towards the front of the building
- Break refreshments will be in the room
- Lunches will be on the roof deck

Technical Presentation Rules

- Each project is given 30 minutes
  - 25 minute presentation period
  - 5 minutes for questions and comment period
- We will hold to these times to be fair to all projects
- Please feel free to provide the researchers and the FAA feedback on the projects directly at breaks and after the meeting by email

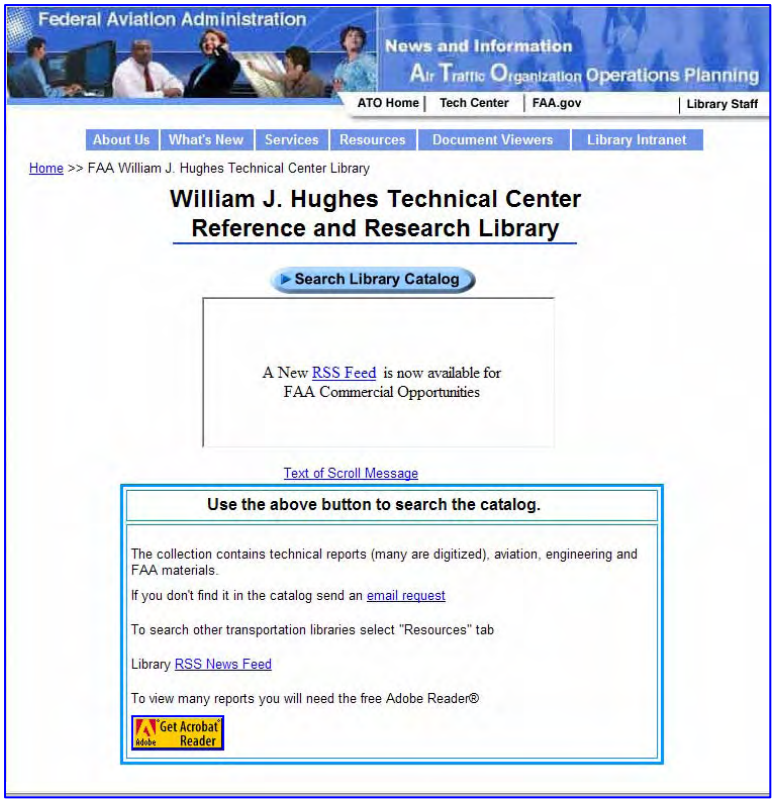
Websites

JAMS Presentations:

http://www.jams-coe.org

FAA Technical Reports:

http://actlibrary.tc.faa.gov



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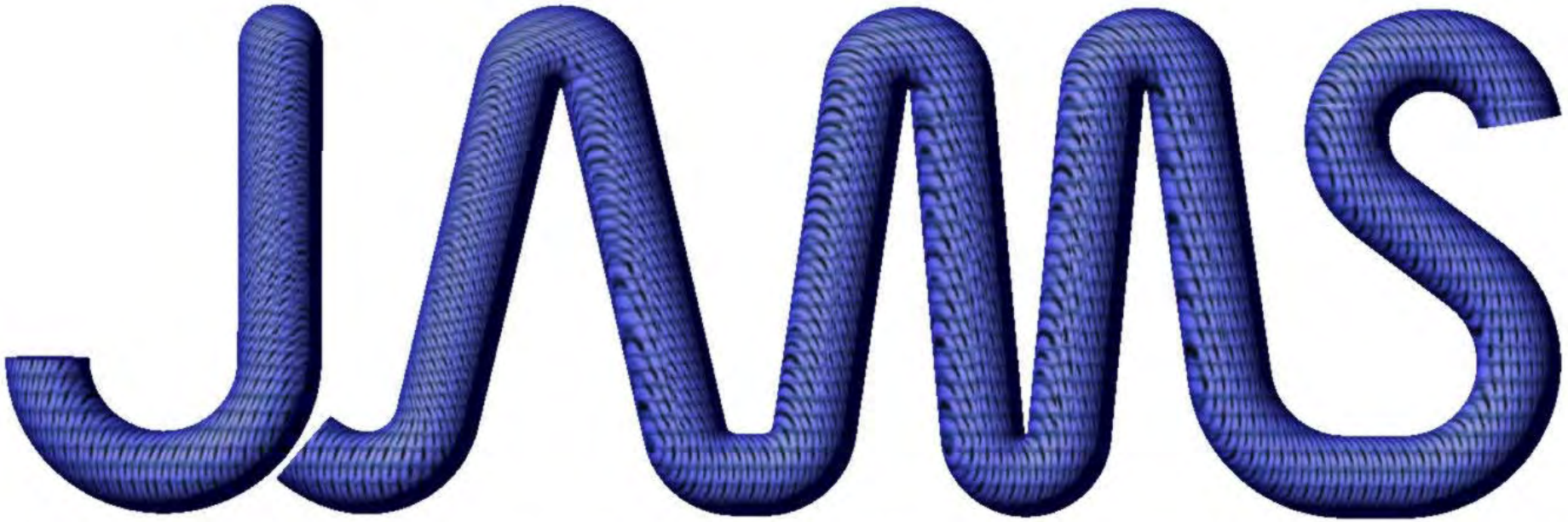
Technical Meeting Theme

- The key to this meeting is its peer review forum
- Please do not hesitate to ask questions on things you do not understand
- Commentary is also welcomed
- While limiting each individual to one question at a time, we do encourage you to write down any additional questions and comments and share them with the researchers and the FAA after the meeting



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