



Thank-you For
Supporting CACRC



Welcome / Introduction / Objectives

Mike Borgman

November 14, 2007

CACRC Fall 2007, Wichita KS, USA

Thank-you To Our Sponsors!

Hawker Beechcraft

NIAR





Welcome!

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- Thank-you for attending our event
- We have a difficult mission and appreciate the help and/or input
- Please enjoy the refreshments provided
- Lunch will also be provided
- Restrooms located across from elevators on all three floors



CACRC Fall 2007 Sponsors

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- Thank-you to our sponsors for this meeting
 - Hawker Beechcraft Corporation 
 - National Institute for Aviation Research 
 - Greater Wichita Economic Development Coalition
 - The one-stop for Wichita/Sedgwick County economic development inquiries 
 - Spencer Reed Group, LLC 
 - Aerospace design and analysis outsourcing, as well as contract and direct hire placement in the Aerospace industry
- And a special Thank-you to our event coordinator
 - Michelle Thomsen



CACRC Background

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- Representatives of the ATA, IATA and SAE CRTFs met in 1991 to propose an organization and structure for a coordinated composite repair standardization effort.
- Titled the “ATA/IATA/SAE Composite Repair Industry Advisory Committee”
- Representatives reached agreement on definition of task groups based on airline hurts surveys
- Each organization agreed to terminate their existing CRTFs and the first meeting of the newly formed CACRC was conducted on December 3-5, 1991 in Washington DC.

Note: CRTF = Composite Repair Task Force



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CACRC Bylaws

- Definition of Problem
 - Standardization of composite repair is becoming increasingly important to aircraft operators. Cost of ownership of composite aircraft and engines structures has become a serious concern
- Charter
 - Develop and improve maintenance, inspection, and repair of commercial aircraft composite structure and components and reduce maintenance costs.



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Member Affiliations

- Representation at the CACRC includes...
 - Airlines
 - MRO's
 - OEM's
 - "Tier" Suppliers
 - Regulatory Policy Agencies
 - Regulatory Research Entities
 - Material Suppliers
 - Academia

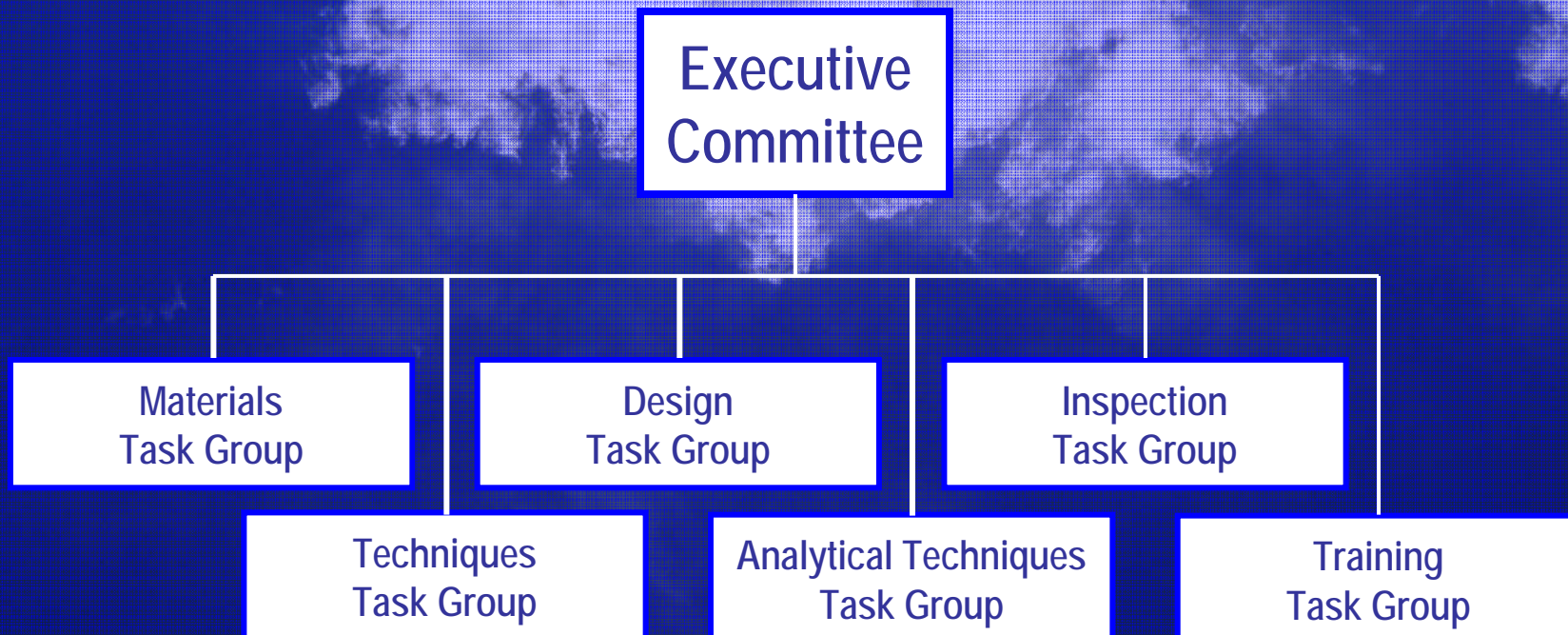


CACRC Organization

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- CACRC Organizational Entities
 - Executive Committee
 - Main Committee
 - Task Groups





CACRC Organization

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- Executive Committee Composition (Per By-Laws)
 - Six Airline members
 - Six OEM Members
 - Secretary
 - Liaisons
- Main Committee Composition (Per By-Laws)
 - All who would like to participate
 - Members
 - Suppliers
 - Liaisons
- Task Groups
 - Working groups that produce standards documents



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"Task Group" Project Assignments

Repair Materials Task Group Assignment

- "Standardize matrix resins, fibers, prepregs, adhesives, and perform material testing." (Using ARP's produced by CACRC Processes Task Group))

Processes/Techniques Task Group Assignment

- "Standardize techniques like scarfing, lay-up sequences, damage removal, bagging, drying, impregnating, surface prep (provide basis processes for CACRC Materials Task Group)

Inspection Task Group Assignment

- "Standardize inspection methods and techniques like damage assessment (size and type), pre- & post-repair inspection."



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"Task Group" Project Assignments

Design Materials Task Group Assignment

- "Actual damage size related to allowable and repair damage limits, accessibility, location and type of damage, susceptibility to FOD/lightning, available repair types, interchangeability."

Training Task Group Assignment

- "Curriculum for airline composite repair specialists, airline repair design engineers, aircraft mechanics, and inspectors."

By-Laws: Analytical Techniques Task Group Assignment

- "Publish a standardized technique for analyzing repairs."



CACRC Publishing Entity is SAE

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 - Web Site: <http://forums.sae.org>
- We will be circulating a roster, please sign



40 Representative Affiliations *Registered At This Week's Meeting*

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Abaris Training
Abbott Aerospace
Airbus
Alenia Aeronautica SpA
All Nippon Airways
Boeing
Capital Aviation Support
Cirrus
Cornerstone Research
Delta Airlines
EASA
Edmonds Community College
Embraer SA
FAA
GE Aircraft Engines
Goodrich Aerospace
Hawker-Beechcraft Corporation
Heatcon Composite Systems
ICES Corporation
Japan Airlines International

JCH Consultants
Lufthansa Technik AG
Middle River Aircraft Systems
National Transportation Safety Board
Northwest Airlines
PAMA/SAE International
Phantom Works
<i>Pratt & Whitney</i>
Pryer Machine and Tool
SAE
Saint-Gobain Performance Plastics
Sandia National Labs
Sefko Ltd
Spencer Reed Group
Spirit Aerosystems
Structured Research
UC San Diego
United Airlines
Wichita Area Technical College
WSU/NIAR



Typical CACRC Meeting Format

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- A “week long” meeting is held every twice per year, once in Spring and once in Fall
 - Spring meetings held in Europe or Pacific Rim (typically)
 - Fall meetings held in North America (typically)
- First two days typically devoted to...
 - Task Group (working group meetings)
 - Executive committee meetings
- Last three days
 - Main Committee Meeting



Fall 2007 Meeting

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- Today's Meeting
 - Field Experience
 - Discussion of Forming New Task Group
 - Sponsor Presentation
 - FAA Policy Update – AC20-107A
 - Developments in Training Opportunities
 - CMH-17 Update



Current Organization Attention Item Problem Definition Resolution

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Ref: Blohm, CACRC Spring 2007, Amsterdam

Most of the issues that existed 20 years ago still exist!

◆ Materials

- Numerous types, styles and procurement specifications.
- Limited and/or untimely availability.
- Minimum purchase amounts and cost associated with the expiration of shelf life.
- No standard means of determining substitutability.

◆ Repair Techniques

- Limited options, Component specific, OEM driven.
- Inability to standardize materials and repair processing due to unknown effects on design properties.
- Limited independent analysis capabilities.
- Denied access to design loads and material allowables necessitating innovative repair solutions.



Current Organization Attention Item Problem Definition Resolution

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Ref: Blohm, CACRC Spring 2007, Amsterdam

Most of the issues that existed 20 years ago still exist! (cont.)

◆ **Repair Access**

- Repairability in design.
- Self inflicted damage associated with obtaining back side access to damaged areas.
- Cost associated with lack of access.

◆ **Tooling and Equipment**

- Inability to obtain OEM loft data.
- Concern over exact replication of OEM tooling.
- Compatibility of tooling material selection.
- Consideration of thermal coefficient of expansion.
- Repair spring back vs. manufacturing spring back.



Current Organization Attention Item Problem Definition Resolution

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Ref: Blohm, CACRC Spring 2007, Amsterdam

Most of the issues that existed 20 years ago still exist! (cont.)

◆ Approval Legalities

- All process and/or material deviations require formal approval.
- A DER is the main means of obtaining FAA repair approval.
- Repair processing must be approved by the customers engineering department.
- Lack of trust in bonded repairs.

◆ Training

- Dedicated training and licensing is still not mandatory.



Note of Agenda Change

Borgman Proposal (Nov 13, 2007)

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Executive
Committee

Proposed New
Task Group

Materials
Task Group

Design
Task Group

Inspection
Task Group

Safety Management
Task or Process Group

Techniques
Task Group

Analytical Techniques
Task Group

Training
Task Group

- Organization felt "Safety Management" title might convey wrong message
- Borgman objectives not sufficiently clear to Executive Committee
- Response: Change title add further definition to objectives
 - Presenter Change (9:00-9:30) Borgman to Seaton



Today's Meeting Objective

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- Main Committee feedback
 - AC 20-107A Revision Proposals
 - Comments on strategies to improve implementation of CACRC standards
 - Comments on incentives for standard repair approaches
 - Comments on training opportunities and suggested improvements to training opportunities



Note of Agenda Change

SAE Update

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- SAE unable to attend meeting
- Borgman offering "SAE Update"



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SAE Update



SAE Update

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- Intellectual Property (IP) Policy
 - Controversy over disconnect between today's SAE IP policies and original agreement between CACRC and SAE (1991, SAE/Klavon)
 - I told SAE/Kerri that only acceptable resolution is "blanket statement" from SAE allowing CACRC members complete freedom to use of CACRC standards documents, at our discretion and as needed

Hi Mike,

Thanks for the feedback today. Per our conversation, I will talk to Ed Manns regarding this issue later this week when he gets back to the office. Please also ask that those senior members send their feedback to not only Scott Klavon, but also to Ed Manns and myself. I will also be sending out an email to those senior members requesting their feedback once I have had a chance to speak with Ed.

Please know that SAE will work to be as flexible as they can with this matter.

Thanks again!

Kerri



SAE Update

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- Please sign roster when it is circulated