

Advanced Materials

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Technology Bulletin

at the Center of Excellence for Composites and Advanced Materials



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ADVANCED MATERIALS IN TRANSPORT AIRCRAFT STRUCTURES

FEDERAL AVIATION ADMINISTRATION

NATIONAL INSTITUTE FOR AVIATION RESEARCH

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C08-01

CACRC meeting held at NIAR



A meeting of the Commercial Aircraft Composite Repair Committee (CACRC) was held Nov. 12-16 at the National Institute for Aviation Research at Wichita State University, with more than 75 members attending. Members of the Safety Management Working Group (SMWG) of Composite Material Handbook 17 (CMH-17) were present to assist in developing a Safety Management mission within CACRC.

The week began with meetings of the six existing CACRC task groups: Training, Repair Design, Repair Analysis, Repair Materials, Repair Processes, and Damage Assessment and Quality Inspection.

A session of the entire CACRC membership discussed a new task group focused on safety management and certification and introduced a proposed charter with objectives. This new task group will focus on integrating task group efforts and is accountable to the executive steering committee. They will concentrate on primary safety initiatives promoted by the task groups and organizations external to the CACRC.

Discussions were led by Mike Borgman the CACRC chairman, Larry Ilcewicz of the Federal Aviation Administration and Charlie Seaton of Edmonds Community College, resulting in modifications to the proposed charter and objectives and the addition of two specific initiatives for consideration.

Based on membership feedback, the following was presented for approval on to the CACRC membership:

1. The new task group is to be identified as the Airworthiness Task Group (ATG).
2. The ATG is to be led by a coordinator (to be determined) and supported by initiative “champions” or leads, which are familiar with aspects of the selected safety initiatives and able to commit resources.
3. Objectives for the ATG include:
 - a. Facilitate processes within the CACRC and its task groups that identify and prioritize significant safety and policy issues and related action items;
 - b. Facilitate the establishment of criteria by the task group leaders, through a consensus process, to evaluate effectiveness and completeness in accomplishing CACRC overall objectives as established by the executive committee;
 - c. Implement initiatives under the guidance and concurrence of the executive committee, in conjunction with the task groups;
 - d. Establish consistent processes for creating universal, acceptable standards in order to reduce composite maintenance costs and improve airworthiness safety.
4. The two safety initiatives, as proposed and accepted by the CACRC membership with discussions concerning implementation details on each, are as follows:
 - a. Update Advisory Circular 20-107A: Composite Aircraft Structure Certification and Compliance; Ilcewicz will be the lead.
 - b. Document guidelines showing the steps involved in the substantiation of standards (design, materials and processes) for composite repair, including examples; the lead is to be identified.

To view presentations given during the CACRC executive committee and general membership meetings, please visit:

<http://www.sae.org/servlets/aerostd/committeeHome.do?comtID=TEAAMSCACRC>.

Also included in the week’s events were guided tours at NIAR, Spirit Aerosystems and Hawker Beechcraft. The meeting sponsors were Hawker Beechcraft, NIAR, the Greater Wichita Economic Development Coalition and Spencer Reed Group. The next CACRC meeting is scheduled for April 21-24, 2008 in Athens, Greece.

As aircraft manufacturers and airlines investigate extreme methods to reduce costs and increase operational efficiency, an increasing number of aircraft are using composite materials in structures critical to flight safety. Engineers and inspectors involved in certification and continued airworthiness assessments must be familiar with principles of composite damage tolerance and the related maintenance practices, including inspection and repair. Since the 1990s, organizations such as the CACRC and CMH-17 (formerly known as MIL-HDBK-17) have been documenting practical composite educational materials, engineering guidelines and standards.

The CACRC is an international standards organization established to develop and improve maintenance, inspection and repair practices for commercial aircraft composite structures and components, and to reduce maintenance costs. It was formed in 1991 through the merger of separate Composite Repair Task Forces operating at the time under the Air Transport Association of America (ATA), the International Air Transport Association (IATA) and the Society of Automotive Engineers (SAE).

In addition to ATA/IATA/SAE entities, membership includes representatives from OEMs, regulatory agencies, material manufacturers and technology experts from the field of composite structure and repair. Since its conception, the CACRC has published more than 25 SAE standards and reports supporting maintenance practices for composite aircraft structures. Advancements by the CACRC depend on progress by working groups, which are comprised of experts from industry (airlines, maintenance organizations, suppliers and training providers), regulatory agencies and academia.

The vision statement of CMH-17 is to develop world-class engineering handbooks for structural applications of composite materials. These handbooks include standards for test/characterization methods, statistics and databases, as well as guidelines for processing, design and analysis. All information contained in the Composite Material Handbooks is developed by working groups comprised of experts in industry, government and academia from around the world, and is subjected to a rigorous review process prior to its official release.

The FAA and the European Aviation Safety Agency (EASA) have coordinated recent composite safety and certification initiatives to benchmark industry practice with the CACRC and CMH-17. One such initiative is the FAA's Joint Advanced Materials and Structures Center of Excellence (JAMS), comprised of the Center of Excellence for Composites and Advanced Materials (CECAM) and the Center of Excellence for Advanced Materials in Transport Aircraft Structures (AMTAS). The joint center, lead by Wichita State University and the University of Washington, addresses the engineering and science issues associated with safety, regulation and product certification of advanced materials and structures to assure equivalent or higher levels of safety compared with existing technology. It also establishes engineering standards and provides training in the area of advanced materials and structures.

For more information about the Center for Advanced Materials Performance at Wichita State University's National Institute for

Aviation Research visit the [CECAM](#) website.



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