



Federal Aviation  
Administration

# FAA / CAAs “Composite Safety & Certification Meeting”

## - Meeting Purpose & Objectives -

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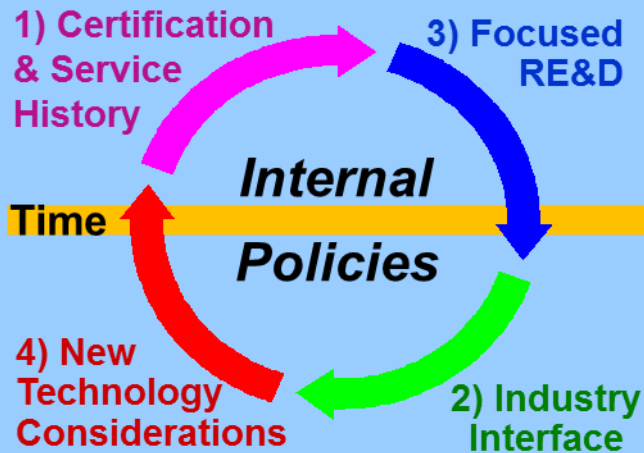
# Composite Safety & Certification Initiatives - AVS Composite Plan -

## Objectives

- 1) Work with industry, other govt. agencies and academia to ensure safe and efficient deployment of composite technologies used in existing & future aircraft
- 2) Update policies, advisory circulars, training, and detailed background used to support standardized composite industry practices

# FAA Approach to Composite Safety & Certification Initiatives

## Evolving



#) Order of Influence for Unwritten Internal Policies

Rules & General Guidance

Detailed Background  
(Various forms of technology transfer)

## Mature

Policy Statements

Advisory Circulars

FARs

Training (Workshops, Courses, and Videos)

**JAMS** JOINT ADVANCED MATERIALS & STRUCTURES CENTER OF EXCELLENCE

Public Documents and Standards (e.g., CMH-17, SAE AMS, Contractor Reports)

# Important Teammates

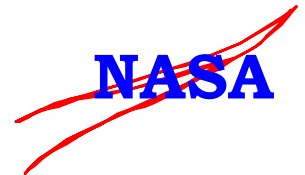
- Partnerships with industry have been essential, including working groups & standards org. (e.g., **CMH-17**, SAE P-17, **CACRC**, ASTM, SAMPE, AGATE, SATS, RITA, SAS/IAB/AACE)



Training  
Databases  
Standardization  
Engineering guidelines



- EASA, TCCA and other foreign regulators**
- NASA research and other support
  - Significant research support since 1970/1980s
  - AA587, A300-600 accident investigation
- DOD and DARPA research
  - NCAMP support to material standardization



# Composite Technical Thrust Areas

*Advancements depend on close integration between areas*

Material Control, Standardization  
and Shared Databases

## Structural Substantiation

- Advances in analysis & test building blocks
- Statistical significance
- Environmental effects
- Manufacturing integration

## Progress to Date 2012

- AC 20-107B (9/09)
- 3 other Advisory Circulars
- 7 Policy Memos/Statements
- 16 Workshops
- 4 Training Initiatives
- 2 Technical Documents
- CMH-17 Updates
- SAE CACRC Standards
- ~60 FAA R&D Reports

## Damage Tolerance and Maintenance Practices

- Critical defects (impact & mfg.)
- Bonded structure & repair issues
- Fatigue & damage considerations
- Life assessment (tests & analyses)
- Structural test & analysis protocol
- Accelerated testing
- Structural tear-down aging studies
- NDI damage metrics
- Equivalent levels of safety
- Training standards

Bonded Joint  
Processing Issues

Advanced Material  
Forms and  
Processes

Flammability &  
Crashworthiness

*Support to future  
cabin safety initiatives*

# Overview of AVS Composite Plan

- Based on safety management approach
- The Plans are linked to:
  - Best Industry Practices
  - Research
  - Certification and field experiences
  - Projected technology advances in aircraft structure
- Priority given to structural issues, related manufacturing procedures and maintenance practices coming from service experience and industry input.

Continued Operational Safety (COS)	Certification Efficiency (CE)	Workforce Education (WE)
COS A: Bonding Initiatives	CE A: Hybrid F&DT Substantiation	WE A: Composite Manufacturing Technology
- Bonded Repair		
- Bonding Quality Control	CE B: Advanced Composite Maintenance	WE B: Composite Structure Technology
- Sandwich Disbond Growth	CE C: Composite Structural Modifications	WE C: Composite Maintenance Technology
COS B: HEWABI	CE D: Composite Quality Assurance	Composite Basics
COS C: Failure Analysis of Composites Subjected to Fire	CE E: Bonded Structure Guidance	Composite DER
	CE F: General Composite Structure Guidance	
<u>Support to future COS Initiatives</u> Aging Composite Aircraft Teardown	Transport Crashworthiness	
	Lightning Protection	
	CMH-17 Revision H	



# FAA / CAAs “Composite Meeting” - Background & Purpose -

## • Background & Purpose

- FAA have extensively engaged in the efforts of promoting Composite Safety, Certification Efficiency and Workforce Education since 1999.
- Many of these efforts have involved the participation of EASA & TCCA. Many CAAs missed the exposures.
- As the composite airplanes (e.g., Boeing 787, Airbus 350) are increasingly operated in the global environment, we would like to establish a **link** with the CAAs who missed the engagement.
- This **link** would provide the very needed safety management guidance for the operation of composite airplanes.



# FAA / CAAs “Composite Meeting”

## - Meeting Objectives (Sept. 1-4, 2015) -

- **Meeting Objectives**

- To provide brief description of available FAA composite policy, guidance and training.
- To provide introductory review on composite certification and compliance methods as currently documented in Composite Material Handbook 17 (CMH-17).
- To review the general composite guidance included in FAA Advisory Circular 20-107B (AC 20-107B).
- To share FAA workforce education strategy/plan and introduce the Level II safety awareness courses.
- To outline FAA AVS Composite Plans for additional developments to be completed over the next seven years.



# Meeting Agenda

## **Tue, Sep. 1 (AM)      FAA Composite Initiatives**

- FAA Composite Plan: Background, Accomplishments
- Global Efforts: Approach, Industry Interface, Standards

## **Tue, Sep. 1 (PM)      Composite Material Handbook 17 (CMH-17)**

- CMH-17, History, Organization and Revision G Updates
- Vol. 3, Ch. 3: Aircraft Structure Certification and Compliance

## **Wed, Sep. 2      Composite Aircraft Structure (AC 20-107B)**

- Development of AC 20-107B
- **CAA Programs and Experiences**
- AC 20-107B Technical Review (Paragraph 1 through 8)

# Meeting Agenda (*continued*)

## **Thu, Sep. 3 (AM)                      Composite Aircraft Structure (AC 20-107B), *Continued***

- AC 20-107B Technical Review (Paragraph 8 through 11)
- Recap and Discussion (Future AC 20-107C Plans)

## **Thu, Sep. 3 (PM)                      CAA Programs and Selected FAA Technical Areas**

- CAA Presentations and Discussions
- Material Qualification, Bonding, Severe Impact Threats

## **Fri, Sep. 4 (AM)                      FAA Composite Plans and Workforce Education Review**

- Forward Looking AVS Composite Plans
- Safety Awareness Courses (Maintenance, Structural Engineering, and Manufacturing)

# CAA Presentations

- **Sep 02 (Tue) AM**
  - [CAA of New Zealand]
  - [CAA of Israel]
  - [CAAC of China]
  - [CAD of Hong Kong]
  - [CAA of Singapore]
- **Sep 03 (Wed) PM**
  - [CAA of Taiwan]
  - [DGCA of Turkey]
  - [DGCA of India]
  - [DCA of Malaysia]
  - [DGCA of Indonesia]
  - [CAA of Korea]



# FAA / CAAs Composite Safety & Certification Meeting

- **Thanks to CAAS/SAA for Hosting Meeting.**
- **Thanks to CAAs for Participation.**
- **Link to Participants Talent Pool.**
- **Global Aviation Safety is Our Mutually Shared Purpose & Objective.**

