

JAMS

Safety Management

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The Joint Advanced Materials and Structures Center of Excellence

- Motivation and Key Issues
 - Safe practices of composite materials
- Objectives
 - Promote safe use of composites (education and standards development)
- Approach
 - Industry groups linkage (CACRC/CMH-17)
 - Knowledge transfer through education
 - Case study development

- Principal Investigators & Researchers
 - Charles Seaton and John Tomblin
- FAA Technical Monitor
 - Larry Ilcewicz and Curt Davies
- Other FAA Personnel Involved
 - ACO, FSDO and MIDO offices of the FAA
- Industry Participation
 - Global participation through CACRC and CMH17

Safety Management Initiatives

- Industry Groups Linkage
 - CACRC (Training & Airworthiness Task Groups)
 - CMH-17
- Knowledge Transfer and Education
 - Education
 - ACO Composites Awareness Course Development
 - Composites Maintenance Technology Online Class
 - Certification of Composite Aircraft
 - Technical Reports and Specialized Training
- Case Studies
- Safe Composites Practice

- CACRC Training TG
 - AIR 5719 teaching points for composites maintenance awareness course
 - Proposed AIR to publish case studies (linked to AIR 5719 teaching points)
- CACRC Airworthiness TG
 - Focus on ‘extensive repairs’, identifying common themes involving safety
 - Industry support for new AIR case studies (above)

- CMH-17
 - In process of being organized as a non-profit entity to support creation of standards
 - Issues
 - Copyright
 - Legal protection
 - Revenue generation through intellectual property sales and tutorials

- ACO Composites Awareness Course Development (ACO)
 - Audience: ACO Engineers
 - Content Development
 - Subject Matter Experts

ACO Course Development Schedule

FAA Level II Course on Composite Structural Engineering Safety Awareness

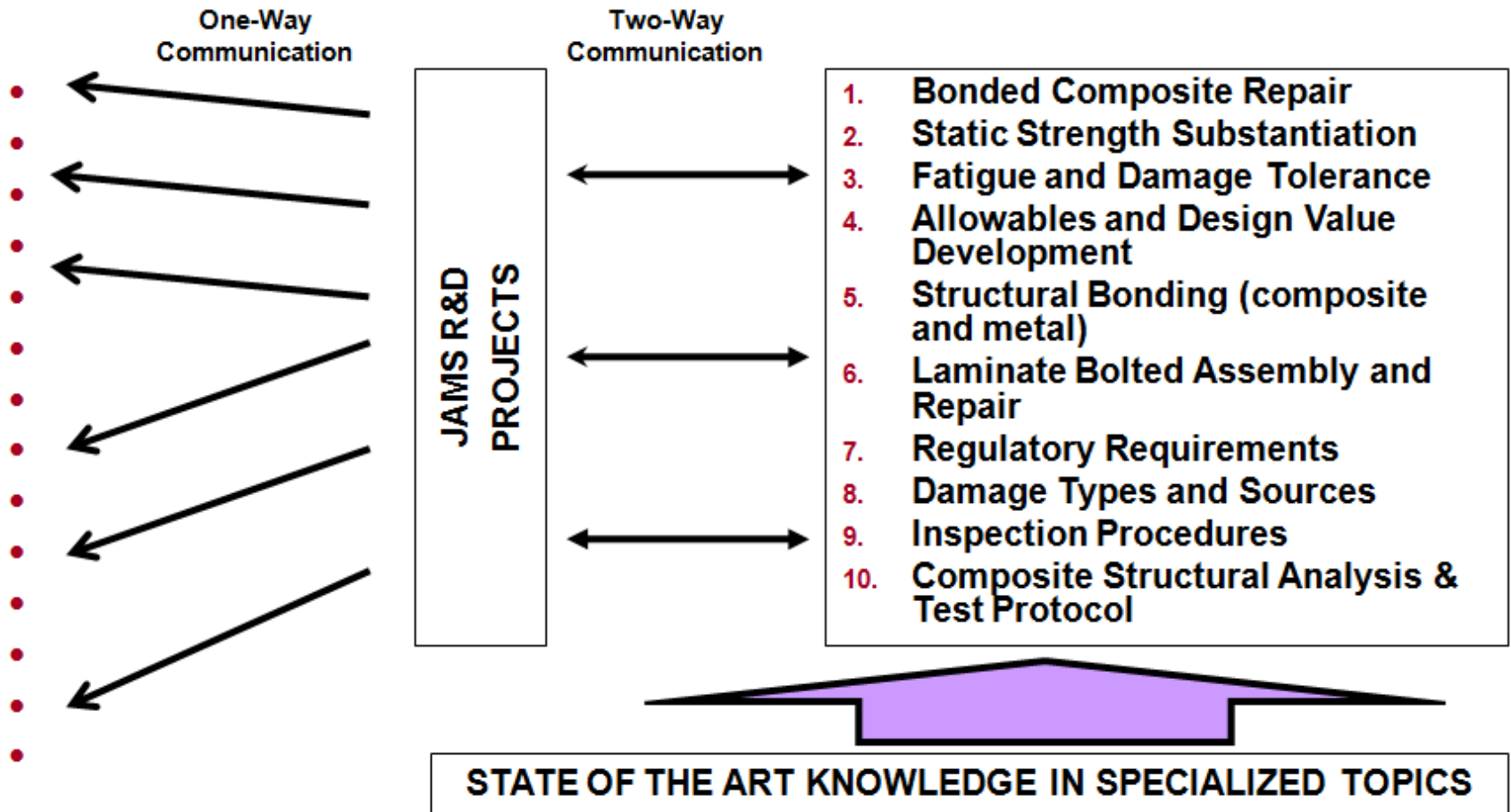
| | | CY 2010 | | | | CY 2011 | | | |
|----|--|---------|-------|-------|-------|---------|-------|-------|-------|
| | | QTR 1 | QTR 2 | QTR 3 | QTR 4 | QTR 1 | QTR 2 | QTR 3 | QTR 4 |
| 1 | Outline: Top Level ("Training Outcome") | ☒ | | | | | | | |
| 2 | Outline: Detail | ◆ | ☒ | | | | | | |
| 3 | Course Objectives (AIR 520 Involvement Point) ("Terminal Objectives") | | ◆ | ☒ | | | | | |
| 4 | Content Text (normally preceded by Teaching Points) | | ◆ | | ☒ | | | | |
| 5 | Teaching Points ("Enabling Objectives") | | ◆ | | | ☒ | | | |
| 6 | Format Selection and Implementation (Classroom, Lab, Online, Multimedia, etc.) | | | ◆ | ☒ | | | | |
| 7 | Multimedia Development (Beginning with WSU August Workshop) | | | ◆ | | ☒ | | | |
| 8 | Assessments ("Testing") | | | | | ◆ | | ☒ | |
| 9 | Beta (5-10 days, 6-12 participants) ("Operational Tryout") | | | | | | | ☒ | |
| 10 | FAA Reporting (Data Item Description or equivalent) | | | | | | | | ☒ |

- Composites Maintenance Technology (CMT)
 - Audience
 - Status
 - Subject Matter Experts
- Certification of Composite Aircraft (CMH17 Tutorial)
 - Audience
 - Status
 - Subject matter Experts
 - Development considerations
 - Content: Online
 - Discussions with SMEs during CMH17 workshop

Technical Reports and Specialized Education: One Model

Technical Reports

Specialized Training



- Objective: Identify safety themes in a format conducive to teaching
- Case studies indicate a need for awareness training at various levels. Examples:
 - Too much reliance on process without understanding technology
 - Instances of working outside SRM without approvals
 - Lack of understanding the limitations of nondestructive testing
 - Understanding the importance of process controls



250°F film adhesive well over 6" diameter

← Incorrect film adhesive (SRM limits to 6 inches)

Burn marks on upper skin from overtemping during hot bond repairs.

Improper use/location of thermocouples resulted in overheating →



Transport Flap Case Study

Discussion Points

- **Roles and Responsibilities**
 - What can be the result of repairs made which are a) outside the limitations of the SRM and b) not properly substantiated?
- **Configuration Control**
 - How could the improper repairs have been detected aside from the lack of fit and function of the part on the aircraft?
- **Process Control**
 - Describe how the various prior repair discrepancies could have been prevented by proper process control during and after the repairs

- Challenge: Overcoming weak incentives for practitioners to take awareness courses
 - “Those who know the least are less likely to see value of awareness education”
 - Recent online CMT course: 100% engineers (no inspectors, technicians or managers who interface with composites)
- Case studies support the need to create short courses for practitioners (e.g. ramp personnel)
 - Practical aspects of safety when working with composite materials
 - Fundamental issues identified through case studies
- Criteria (preliminary)
 - Short, inexpensive, and accessible
 - ‘Meaning before Content’ learning mode
 - Content extracted from CMT course

Short Course Topic Suggestions

- Examples of short course topics should have immediate benefits to student audiences
 - Airline/operator training for auditing MRO facilities, including ‘checklist’ based on FSDO course development (2008)
 - Ramp safety practice for airlines
 - Quality control for composite materials (calibration, time in/out logs, etc.)
 - Tailored topics for general aviation (Cessna or Beech service centers)

- **Benefit to Aviation**
 - Improved safe composites practice through education and promotion of standards
- **Future needs**
 - Continue broad awareness course developments beyond existing offerings
 - Expand awareness courses to short topics having immediate benefit to student audience
 - Encourage global access to (anonymous) case studies to identify safety issues and provide education materials
 - Case studies and training objective development closely linked