Basic Knowledge (A,B,J) Participant Feedback Summary

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General Comments
Course Caveats

This course…

- *Provides an overview of the issues involved in composites' maintenance and repair, beginning with a common level of knowledge of composite materials terminologies and concepts*
- *Is not intended to provide training that qualifies students as composite repair practitioners*

Basic Knowledge Module

Role Clarification of Prerequisite Modules

- Achieve baseline common level of knowledge
  - Build knowledge level which allows students to understand terminologies and concepts in ‘fundamental’ course
- Prerequisite course ought not to be either mandatory or combined with ‘fundamental’ course
  - Boredom for experienced practitioners
  - Extends ‘fundamental’ class time commitment, reducing participation (potentially)
  - Training organizations: Can utilize assessments to determine skill level and need for student to take course

Basic Knowledge Module - Overview

- Course detail-Mixed Messages
  - Too much detail for prerequisite course
  - Should have enough knowledge to understand terminologies in ‘general meeting contexts’
  - Defer ‘lessons learned’ to base course
- Include expanded references list for students
- Include expanded or web-linked glossary list
  - Global vernacular
  - CACRC glossary list may be excellent baseline

TCO A Module - Understand basics of composite materials technology

- **A2: Describe various composite processing parameters**
  - Clean Room – application to field repairs
    - Be aware of issue
    - Necessity for adaptability under extreme conditions (e.g. tents)
      - Process sensitivity (e.g. layup)
      - Lessons from other industries (?)

TCO A Module - Understand basics of composite materials technology

- **A3: Describe *and/or list* composite design parameters and effects of processing**
  - Porosity/void content
    - Relationship among porosity and properties
    - Clarify TCO title (material properties instead of design paramaters)
  - Fatigue
    - Identify the importance of varying combined properties between fiber and resin with cursory reference to existence of fatigue

TCO A Module - Understand basics of composite materials technology

- **A4: Describe various composite machining, assembly and finishing processes**
  - Differentiate between metallic technology and composite technology porosity and properties
    - Importance: transition from metal to composites' environment for practitioner
    - Galvanic corrosion
      - Mention importance
      - Mention anti-corrosion schemes in original design
  - Composites technology is 'only' another technology – minimize fear/threat of change

TCO A Module - Understand basics of composite materials technology

- **A5: Describe stiffened laminate and sandwich applications and structural properties**
  - Emphasize generic approach, not making this specific to any particular aircraft application

TCO B Module - Understand the basics of composite materials maintenance and repair

- Perception of duplication of material with later course modules
  - Modify Module description: “Understand terminologies associated with composite materials maintenance and repair”
  - Other feedback: Prerequisite and fundamentals course should ‘stand on their own’
    - Students may not take both courses
    - Redundancy enhances learning process

TCO B Module - Understand the basics of composite materials maintenance and repair

- **B1: Be exposed to the basic steps in maintenance procedures from damage detection through repair completion**
  - Add a section on roles (brief) of engineer, technician, inspectors. Provide clear guidelines on background needed to do a proper job
- **B2: Be exposed to key composite and expendable materials needed for simple laminate structure repair including appropriate storage requirements**
  - “Allow to reach room temperature without addition of artificial external heat source” instead of “warming”

TCO B Module - Understand the basics of composite materials maintenance and repair

- **B5: Describe the differences between repairing composite and metal structures, including discussions about metal bonding**
  - Galvanic corrosion should be addressed as a phenomenon, emphasizing importance of following procedure

TCO J Module -Understand other critical elements of composite maintenance and repair

- **J1: Discuss issues affecting the selection of bonded or bolted repairs**
  - Define difference between two – current practice doesn't commonly utilize bolted repair. However, emphasis on bolted repair is expected to become a bigger requirement due to heavy laminate applications on new generation aircraft
  - Maintenance is/will be defined by SRM source documentation

TCO J Module -Understand other critical elements of composite maintenance and repair

- **J5: Discuss proper disposal of wastes from the composite repair process, including EPA/OSHA requirements**
  - Disregard EPA/OSHA requirements – make culturally generic
- **J6: Discuss emerging advances in repair process technologies that may appear for bonded and bolted repair and quality control**
  - Address keeping up with evolving technologies and utilizing up to date source documentation

TCO J Module -Understand other critical elements of composite maintenance and repair

- **J7: Discuss emerging damage and repair inspection technologies, such as bond testing, moisture meters, interferometer (3D characterization)**
  - Address keeping up with evolving technologies and utilizing up to date source documentation

Written Feedback Collection Slips

- **Information has been collected and will be considered for incorporation into TCOs and content**
  - **Most feedback quite detailed and technical in nature**
  - **‘Issues’ feedback – considered in breakout sessions**