

GENERAL COURSE DESIGN COMMENTS

- Keep in mind target audience: “introductory course ... focused on technicians, engineers, and inspectors”; add managers, auditors, QA. Assume already familiar with repair process and metallic structure.
- Keep content at interest level of audience
- Assume details for those doing the work will be covered in other courses.
- Keep short enough to make attractive - 3 days?

GENERAL CONTENT COMMENT

- Too much repetition - stream-line to fit in schedule.
- Move more of the basic info to the prerequisites.
- Focus is on existing sandwich structure. Add detail on complexities of structure
- Terminology - need to be consistent
- Every section should focus on key issues, why they are important, and differences from metal structure

TCO F - Fabrication and Bonded Repair - Comments

- Focused on factory laminate - move p1 and 2 to TCO A, and combine and move F1 and F3 laminate fabrication/MRB to TCO A.
- Discuss fiber/resin volume - impact on strength, wet lay-up versus prepreg resin content, resin started with vs. bleeding.
- Condensation on prepreg is bad. Explain.
- Cure cycle controls time and temperature and vacuum/pressure.
 - Cure variables must be monitored, including temperature, time, and vacuum.
 - Thermocouple quantity and placement is critical to ensure uniform heat. Aware of heat sinks.

• Discuss contamination sources

TCO F - Fabrication and Bonded Repair - Comments

- Tooling needs and limitations
 - Warpage caused when heat softens the resin and then force applied by vacuum bag, without enough structure remaining to resist the force.
 - Local heating to avoid softening surrounding structure
 - Access to both sides preferred for bagging, inspection, etc.
 - Aware of sub-structure
- Repair steps can occur in parallel
- Add bullet for difference between Co-curing vs.. co-bonding

TCO G - Bonded Repair - COMMENTS

- Drying thick laminates can be very time-consuming and uncertain. Follow source data for acceptable drying times.
- Stress key characteristics affecting repair quality
 - What are they?
 - Fiber type and orientation
 - Cure temp/time
 - Etc?
- Co-curing versus co-bonding differences

TCO I - Bolted Repair - COMMENTS

- Move basics to prerequisites
- Issues with drilling metal and composites together
- Awareness of different failure modes and quality
- Preparation of holes before installation
- Demonstration might be easily replaced by video or photos. But complete inspection criteria for fasteners is beyond scope of this course.