Course R-15
Advanced Windblade Repair

Course Summary

This 5-day advanced level repair course is a follow-on to our R-5 Composite Wind Blade Repair course. This is for the repair designers, technicians, mechanics, supervisors, and quality assurance personnel directly involved in providing high performance repairs to advanced composite structures. This course will cover more detailed repairs, such as repairs to spars, along with tooling and different repair processes.

Introduction

This class is devoted to hands-on repair skills. Less time is spent in the classroom and more time is spent in the workshop, allowing the student time to practice different repair scenarios. Students will be given a variety of damaged parts and structures to perform repairs throughout the week. Practice in evaluating the material type and ply orientation of an unknown structure, repairs to spars, fabricating tooling to regain part shape and utilizing other repair processes. In addition, each student-team will be assessing damage to real Wind Blade structures, determining a repair approach, and undertaking the repairs. Over the five-day period, several different parts will be repaired by each team of participants, utilizing different materials and the challenges that come with each new repair scenario. Repairs will be cured using both room temp and elevated temperature cure cycles with different types of hot bonders and hot bonding techniques. Attention will be given to Thermocouple placement and control of the hot bonders. The advantages of each will become familiar to the students as they will have the opportunity to work with several of them individually throughout the week.

Topics

Key Lecture Topics

- Review of composite materials and processes
- Materials used for tooling.
- Repairs to spars/solid laminates
- Damage detection and assessment of the damage
- Resin infusion process
- Various ways to supply heat to the repair

Workshop Exercises

- Each team of students will access various damages and determine the best way to remove damage and repair part.
- Each team will complete a repair appropriate to the level of advanced repair allowed by their company (which can include, but is not limited to);
    - Spar Repair
    - Repairs requiring support tooling to complete
    - Resin Infused repairs
    - Through damage repair with access to both side
    - Through damage repair with no access to the backside
    - Replacement tip manufacture and installation

Course Benefits

Attendees will advance their repair skills and learn methods and techniques that can be immediately deployed in the field.

Prerequisites

R-5 Composite Windblade Repair

Teaching Method

Active classroom lecture and workshop exercises: 25% Theory and 75% Practical

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