CBT TNA – Composite Awareness Training

Course Overview

The use of composite materials in aviation has been increasing rapidly over the last decade, this is due to the materials characteristics of high strength and flexibility at a low weight. It is these value's that have seen the material developed into fuselage structure on aircraft such as the Boeing 787 and the Airbus A350.

Composite awareness and the ability to know how damage can be recognised, assessed, or can remain hidden is vital for all who deal physically with the aircraft or deal with the structure and design of repairs and modifications where composite materials are utilised.

The online CBT is intended to address the theory elements only and if you have any queries please email info@oat.aero to further discuss options.

Course Contents

Composite Awareness

- Inspection of Carbon Fibre / Glass Fibre Reinforced Polymer Composite Components & Honeycomb Sandwich Parts
- Inspection Techniques and Tap Testing
- Composite Materials Introduction

Definition of Composite Materials

- ***Glass Fibre Reinforced Polymer (GFRP)***
  - Structure and Formation: Woven fabric, chopped strand mat
  - Uses and Advantages: Strength, lightweight, non-conductive
- ***Carbon Fibre Reinforced Polymer (CFRP)***
  - Formation and Uses: Unidirectional sheets, moulding, repair
  - Characteristics: Lighter, more rigid than GFRP, conductive
- ***Quartz Fibre Reinforced Polymer (QFRP)***
  - Stability and Use: Higher temperature stability, excellent insulator, limited use due to cost

Course Contents Continued

Composite Materials and Construction

- Various Applications: B787 fuselage, A350 window frames, floorboards, flap track fairings, etc.
- Structural Awareness: Floor beams, control surfaces, panels, doors, flooring, and cabin furniture

Composite Inspection Methods

- Tap Test: Recognizing damage through sound changes
- Light Inspection: Shadows and deflections to identify damage
- Non-Destructive Tests (NDT): Ultrasonic inspection devices

Tap Testing

- Procedures: General tap test for damage and repair inspection, specific methods for Boeing and Airbus
- Tooling and Preparation: Tap hammers, visual inspection, understanding structure around test areas

Tap Testing Accomplishment

- Steps: Visual inspection, tapping method, interpretation of sounds
- Structural Examination: Incremental scanning, contour following, comparison with known good areas

Boeing 787 Composite Awareness

- Damage Evaluation: Philosophy and tools available (SRM, AMM, NDTM, MEL/CDL/DDG)
- Damage Inspection Process: Following AMM for various incidents (bird strike, lightning strike, etc.)
- Quick Composite Repair (QCR) Patch: Temporary repairs
- Current Return Network (CRN): Awareness of electrical return paths in composite structures
- Evaluation and Repair: SRM guidelines for visual inspection, tap test, and non-destructive testing

Airbus A350 Composite Aircraft

- Design Concept: Four-panel fuselage construction
- Damage and Inspections: Electric Structure Network (ESN) and Metallic Bonding Network (MBN)
- Inspection by Non-Specialist NDT Personnel: Ensuring dispatchability

This course is intended to be a learning course with **3 learning hours**.

This course covers only **theoretical knowledge** and while picture and video might be used as required it shall not be intended for practical assessment or instruction.

Regulation Specification Course Taught to:

Course designed to meet requirements working with composite technologies as specified in

- EASA Part 145.A.35(a)
- UK CAA Part 145.A.35(a)
- FAA ATA Specification 104 Level IV (4) where special maintenance tasks may require additional specific training.

Examination & Content Evaluation

Online Questions are based on modular learning and shall be presented following completion of a module – it shall be possible to progress modules without completing the associated questions although no certificate or course completion will be considered without all module questions accomplished to a minimum **pass rate of 75%**.

Queries and concerns on examination material shall only be addressed by examination manager.