



Course Content

for

Training in

Aircraft Composite

Repair Inspection

Training in Aircraft Composite Repair Inspection

General notes

The following recommendations are based on our considerable experience in training aircraft maintenance personnel for structural repair.

The course content has been devised for staff in managerial and supervisory positions. The emphasis will be on quality assurance of repairs and the development of sound inspection procedures.

All the techniques used in the training are based on those given by aircraft and power plant manufacturers. Special attention is paid to the requirements of aircraft manufacturers' structural repair manuals.

Delegates are guided through the stages of a typical repair and the most common causes of repair failure as well as the points which need special attention during inspection

Both theoretical notes and details of repair techniques are provided as a complete set for each delegate in a bound folder. They are backed up by overhead transparencies in the lectures, lecture room exercises, videos and other activities where appropriate.

Delegates are encouraged to question, criticise and to suggest improvements to all the techniques learnt during the training since the subject is still growing and even the manufacturers are unsure about the best way to approach some problems.

3 day course in Aircraft composite Repair Inspection

The emphasis of the course is on developing the background knowledge necessary to inspect and sign off aircraft composite repairs and to ensure that they have been carried out in accordance with published manufacturers' structural repair manuals. The course contains some practical demonstrations to highlight areas of potential problems

The importance of quality assurance is stressed throughout, recognising good and bad practices within the repair procedure.

The main aims of the course are:

- To familiarise the delegate with the materials and techniques used to repair aircraft composite structures.
- To provide the delegate with the knowledge to satisfy the appropriate health and safety requirements.
- To equip the delegate with the knowledge to inspect aircraft composite repairs as they are carried out and to be able to sign them off as being completed according to the methods recommended and accepted by the aircraft manufacturers.
- To familiarise the delegate with the proper storage and handling of composite materials and to recommend effective methods of record keeping.
- To allow the delegate to recognise bad practices
- To provide the knowledge required to interpret standard structural repair manuals and to relate them to a given repair situation.
- To satisfy all the relevant quality assurance requirements.

Outline of the training programme

Aircraft Composite Repair Inspection

First day

am:	<i>Introduction</i> <i>Epoxy resins</i> <i>Fibre reinforcing materials</i> <i>Honeycomb materials</i> <i>Health and safety</i>	pm:	Surface preparation methods for high repair integrity <i>Pre-preg & wet lay-up systems</i> <i>Cosmetic, interim and permanent repairs</i>
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Second day

am:	Repair & hot bonding procedures <i>Restrictions on cure schedules</i> <i>NDT overview</i>	pm:	Damage assessment Repair strategy <i>Choices and restrictions on type of repair</i>
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Third day

am:	<i>Extracting information from SRMs</i> <i>Common pitfalls</i>	pm:	<i>Storage & handling of materials</i> <i>Record keeping</i> <i>Inspection summary</i>
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Practical and demonstration topics are in normal script

Theoretical topics are in *italic* script

Training will be backed up by aircraft manufacturers' training videos where appropriate

Training details:

Day 1 morning:

Delegates will be introduced to the characteristics of the materials used in repair. This will equip them with the knowledge to ensure that the procedures carried out during a repair are appropriate to the materials being used.

The health and safety procedures and requirements for each material will be stressed throughout.

Day 1 Afternoon:

Commonly accepted surface preparation methods will be outlined. Delegates will be shown methods of assessing the suitability of a surface for bonding.

Both wet lay-up and prepreg repair systems will be introduced. Delegates will find out how to decide which system is appropriate to a given repair situation, and when a choice is available.

Levels of repair will be discussed: cosmetic, temporary, interim and permanent. The various aircraft manufacturers' attitudes to each type of repair will be dealt with. Advice on how to decide which level of repair to use will be given.

This section will involve extensive use of SRMs.

Day 2 morning:

After an introduction to the vacuum bagging methods the delegates will be taken, stage by stage, through a typical vacuum bagged repair, by a practical demonstration, or if time permits a group repair exercise.

The restrictions on cure schedules for different types of structure will be detailed.

A brief overview of the NDT techniques for composite repairs will be given.

Day 2 afternoon:

Delegates will be shown the common types of damage encountered in composite components, followed by a discussion of the best repair strategy to adopt for each damage type.

Restrictions on repair methods will be discussed in relation to the above.

Day 3 morning:

The morning will be spent in close study of SRMs with a view to understanding how to extract the large amount of information that is necessary for each repair

Delegates will be shown common mistakes in repairs, so that they can judge the best way to inspect a repair for integrity.

Day 3 afternoon:

After recommendations for storage, handling and material record keeping, the course will be summarised and delegates will be given a chance to evaluate it.

Timing

The timing and duration of the various subjects included in this scheme are based on experience for a reasonably fast working group. The timing and may have to be modified slightly depending on the work rate of the group. Items included above can be replaced by others if the group or company sees fit.