2006 Composite Damage Tolerant Workshop

Thoughts on Thursday Afternoon Sessions:

- Substantiation of Maintenance Inspection and Repair Methods
- Damage/Defect Types and Inspection Technology

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Substantiation of Maintenance Inspection and Repair Methods

Most of the issues that we have today are that same as those we had 20 years ago.

- Materials availability
- Repair techniques
- Tooling
- Legalities Approval issues

What standards will MRO industry need to meet to repair "Next Generation aircraft"

Need Accredited and OEM Sanctioned Engineering tools and Training programs that will facilitate composite structure.

Need to address Data.

MRO will need to undergo paradigm shift to one that is more reliant on OEM support.
Substantiation of Maintenance Inspection and Repair Methods

Fundamental industry trends driven by economic issues are changing the way composite airplanes are maintained.

- Loss of trained personnel
- Increased outsourcing
- Companies that receive the outsourcing are facing challenges

Great examples of the types of real world repairs.

Live and Die by the SRM

OEM Perspectives:

Sprint:

Emphasized the need to design the repair around the facilities and training environment that it will be applied in.

Good example of customized test programs that are flexible enough to accommodate the situation.

Need to Repair Other than OEM Substrate.

Tiger team approach to application of large high performance repairs.

Important to do Proof of Concept.
Substantiation of Maintenance Inspection and Repair Methods

- Airbus perspective
- We have a lot of data:
  - 20 years and 60 million flight hours
- IATA Survey of damage causes.
- Fuselage maintenance is less than 5% of structural maintenance cost
- Fuselage is majority of repairs, mostly on skin
- NDT inspection is potentially needed in case of visible surface damage to assess damage state.
Damage/Defect Types and Inspection Technology

- FAA research for composites
  - New standard for NDI of composites have been developed
  - Tap testing is not practical above about 9 plies
  - New technology evaluation, CATT, Air coupled ultrasonics Gen-Scan thermosonics etc

- Damage/Defect Types and Inspections – Some Regulatory Concerns
  - Concern over large secondary structure and damage events
  - Concern over reliability of BVID Inspections and the potential consequences of missing indications.
  - How important is Colour Finish
  - Is preload on structure at time of impact affecting damage visibility
  - Encourage a blame free culture
  - Secondary bonding, Do we still need redundancy how much.
Damage/Defect Types and Inspection Technology

- Unified Treatment of Impact Probabilistic & Deterministic
  - Approach is to use a probabilistic approach to determine a deterministic design criteria based on threat.
  - Bird strike data is largely available, hail strike data set is less robust (Some NOAA Data is available)