

JAMS Working Group Boeing Prospective

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Joint Advanced Material and Structures (JAMS) CoE
Technical Review Meeting
William J. Hughes Technical Center

July 10-12, 2007

Operational Comments

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- ❑ Many Papers cover similar topics. Maybe they should be grouped together on the same day. This would provide continuity and the authors would be more likely to collaborate with their colleagues doing similar work (e.g. the two adhesive bonding test method papers).
- ❑ An FAA presentation explaining the overall scope, timeline and roadmap of the JAMS, CECAM, and AMTAS programs would be helpful to the new attendees.
- ❑ Absence of key papers is of concern (Crashworthiness of Composites and Full Scale Damage Tolerance of Composites). Perhaps the slides could be presented by an FAA designate, or just shown to the group so discussion could occur.
- ❑ Chart Format – It would be helpful to have a slide at the beginning of the presentation stating the phase the project is in (just starting, midpoint, complete, etc) – so the audience can have a sense of what to expect.
- ❑ Some of the papers were presented so quickly, with information so dense, that the value of the material was diminished.

Areas of Interest to Boeing

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- ❑ Evaluation of NDI processes, techniques, and hardware to improve ability to detect defects and damage in production and in service.
- ❑ Lightning strike mitigation, effects, after-strike repair, etc.
- ❑ Airplane external threat definition and modeling" - this would include hail event understandings and a variety of impact and other types of threats that can occur to airplanes.
- ❑ Inclusion of assessment of effects of defects in the projects wherever appropriate.
- ❑ Repair-related research – training, standardized repair procedures, surface contamination detection, surface preparation for repairs, etc.
- ❑ Testing of repair materials and processes in hot/wet environments.
- ❑ High strain rate evaluations of composites, bonded composite joints, bolted composite joints.

Areas of Interest to Boeing (cont'd)

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- ❑ Improved test methods, especially those that feed analysis tools.
- ❑ Development of common requirements for clean rooms, test procedures to evaluate contamination potential of non-flyaway contact materials, handling procedures for parts to be bonded. (so Boeing doesn't tell a part manufacturer something completely different from what Airbus is telling them).
- ❑ Continued development of prepreg and film adhesive aging tests that can easily detect material that has seen too much time at temperature in shipment.
- ❑ Development of common, inexpensive, reliable time/temperature recording devices to monitor material shipping conditions.
- ❑ ***Experimental vs. Numerical studies***
There should be an expectation (where appropriate) for validation of experimental findings with numerical analysis.

Boeing collaborative efforts

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- ❑ **Boeing has two white papers that were submitted:**
 - 1) *"Standardization of numerical and experimental methods for crashworthiness and energy absorption of composite materials,"* and
 - 2) *"The design of a structural aircraft component utilizing design values simulated with the Strain Invariant Failure Theory."*

- ❑ Boeing has a collaborative effort proposed to work with Prof. Kuen Lin from Univ. of Washington to expand the capability of the *"Development of Reliability based Damage Tolerance Structural Design Methodology"* tool to enable high-cycle fatigue assessment due to vibration and acoustics.

