



# ASIP

## 2005 USAF Structural Integrity Program (ASIP) Conference

*29 November - 1 December 2005  
The Peabody Memphis  
Memphis, Tennessee*

# PROCEEDINGS

Website: [www.asipcon.com](http://www.asipcon.com)



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## CONTACTS

For additional ASIP information and updates, visit our website at: [www.asipcon.com](http://www.asipcon.com)

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## AGENDA

(\*Denotes Speaker)

### MONDAY, 28 NOVEMBER 2005

4:30 PM - 6:30 PM

REGISTRATION

### TUESDAY, 29 NOVEMBER 2005

7:00 AM - 8:00 AM

REGISTRATION/Continental Breakfast

8:00 AM - 9:30 AM

**WELCOME AND ADMINISTRATIVE REMARKS**

*Joseph Gallagher, USAF, Aeronautical Systems Center, Engineering Directorate*

**PRESENTATION BY THE JOHN W. LINCOLN AWARD RECIPIENT**

*Charles R. Saff, The Boeing Company*

**PRESENTATION OF THE LINCOLN AWARD**

9:30 AM - 10:00 AM

BREAK

#### OVERVIEWS

Session Chair: *James Rudd, USAF, Air Force Research Laboratory, Air Vehicles Directorate*

10:00 AM - 10:30 AM

**Damage Tolerance Risk Assessment of T-38 Wing Skin Cracks**

*Joseph Cardinal\* and Hal Burnside, Southwest Research Institute and Michael Blinn, USAF, Ogden Air Logistics Center, T-38 Systems Program Office*

10:30 AM - 11:00 AM

**C-130 Center Wing Fatigue Cracking -- A Risk Management Approach**

*Geoffrey Bateman\*, Lockheed Martin Aeronautics Co. and Peter Christiansen, USAF, Warner Robins Air Logistics Center, C-130 Systems Program Office*

11:00 AM - 11:30 AM

**The C-17 Aircraft External Load to Internal Stress Spectrum Transformation with Correlated Results**

*Archie Woods\*, USAF, Aeronautical Systems Center, Mobile Systems Wing, C-17 Systems Group and Rick Selder and Ko-Wei Liu, The Boeing Company*

11:30 AM - 12:00 PM

**NDE Approach for Structural Integrity Evaluation of MiG-29 Aircraft**

*Capt Krzysztof Dragan\*, Lt Col Slawomir Klimaszewski and Maj Andrew Leski, Polish Air Force Institute of Technology, Poland*

12:00 PM - 1:30 PM

**GROUP LUNCHEON**

Speaker: *Don Edwards, USAF, Aeronautical Systems Center, Director of Engineering, F/A-22 Systems Program Office*  
"Systems Engineering Retrospective"



## TUESDAY, 29 NOVEMBER 2005 (Continued)

### CERTIFICATION

Session Chair: *Shery Welsh, USAF, Airborne Laser Program Office*

- 1:30 PM - 2:00 PM**      **Structural Certification of the F-16 Block 52+ Aircraft**  
*Robert Burt\**, Lockheed Martin Aeronautics Co.
- 2:00 PM - 2:30 PM**      **Implementation and Certification of Integral Structures on the C-17 Aircraft**  
*Kenneth Chan\**, *George Tzong*, *Ko-Wei Liu* and *Hugo Guzman*,  
The Boeing Company
- 2:30 PM - 3:00 PM**      **Airworthiness Certification Strategy for HALE (Global Hawk)**  
*Mo Pourmand*, Northrop Grumman Corp.
- 3:00 PM - 3:30 PM**      **BREAK**

### ADVANCES IN FATIGUE METHODOLOGY

Session Chair: *David Stargel, USAF, Air Force Research Laboratory, Air Vehicles Directorate*

- 3:30 PM - 4:00 PM**      **Combined Use of Strain-Based Fatigue Methodology and Notched Member Test Data**  
*Norman Dowling*, Virginia Polytechnic Institute and State University
- 4:00 PM - 4:30 PM**      **Yield Zone Based Retardation Models - Use With Caution**  
*James Harter*, USAF, Air Force Research Laboratory, Air Vehicles Directorate
- 4:30 PM - 5:00 PM**      **Improved Modeling of R-Ratio Behavior for the Walker Equation**  
*Royce Forman*, NASA Johnson Space Center
- 5:00 PM - 5:30 PM**      **Prediction of Fatigue Crack Growth for 7075-T7351 Aluminum Alloy Under Various Flight Load Spectra**  
*Yoshinori Yamada\**, *James Newman, Jr.* and *T. Lacy*, Mississippi State University and *Joe Luzar*, The Boeing Company
- 5:30 PM**                      **RECEPTION** - Exhibit Hall

## WEDNESDAY, 30 NOVEMBER 2005

- 7:00 AM - 8:00 AM**      **REGISTRATION/Continental Breakfast**

### EVALUATION OF NDI CAPABILITY

Session Chair: *Kenneth LaCivita, USAF, Air Force Research Laboratory, Materials and Manufacturing Directorate*

- 8:00 AM - 8:30 AM**      **Replica-Based Crack Inspection Methods**  
*John Newman\** and *Scott Willard*, US Army Research Lab and *Stephen Smith* and *Robert Piascik*, NASA Langley Research Center
- 8:30 AM - 9:00 AM**      **Destructive Evaluation of C-130 Center Wing Box Lower Skin and Stringers**  
*Dale Cope\** and *Michael Stuerman*, Wichita State University and *Kevin Boyd*, S&K Technology



## WEDNESDAY, 30 NOVEMBER 2005 (Continued)

- 9:00 AM - 9:30 AM**      **Assessment of the Capabilities and Readiness of Nondestructive Inspection Methods for Subsurface Crack Detection in Built-Up Structure**  
*David Piotrowski\* and John Bohler, Delta Airlines; David Galella, FAA, William J. Hughes Technical Center; and Michael Bode and David Moore, Aging Aircraft Nondestructive Inspection Center*
- 9:30 AM - 10:00 AM**      **BREAK**
- FULL-SCALE FATIGUE TESTING AND DATABASES**  
Session Chair: *Thomas Christian, USAF, Aeronautical Systems Center, Agile Combat Support Systems Wing*
- 10:00 AM - 10:30 AM**      **A Database for Documenting Full Scale Fatigue Test and Fleet Teardown Findings**  
*Rigo Perez\*, Thomas Fellner and Cynthia Rose, The Boeing Company*
- 10:30 AM - 11:00 AM**      **Database Development for Destructive Evaluation and Extended Fatigue Testing of Retired Aircraft Fuselage Structure**  
*David Steadman, Delta Airlines and John Bakuckas, FAA, William J. Hughes Technical Center*
- 11:00 AM - 11:30 AM**      **Teardown - An Aid to the Assurance of Continuing Structural Integrity for UK Military Aircraft Programmes**  
*Chris Hoyle\*, BAE Systems and Mike Duffield and Dennis Taylor, QinetiQ, UK*
- 11:30 AM - 12:00 PM**      **Fleet Fatigue Life Interpretation From Full-Scale and Coupon Fatigue Tests - A Simplified Approach**  
*Simon Barter\*, Lorrie Molent and Marcus McDonald, Defence Science and Technology Organisation, Australia*
- 12:00 PM - 1:30 PM**      **GROUP LUNCHEON**  
Speaker: *Michael Hatcher, USAF, Warner Robins Air Logistics Center, Director, Engineering Directorate*  
"ASIP Sustainment Activities and Needs"
- 1:30 PM - 3:15 PM**      **PANEL SESSION**  
**"Current and Future Changes to ASIP Requirements"**  
**Panel Chair:** *Joseph Gallagher, USAF, Aeronautical Systems Center, Engineering Directorate*  
**Panel Members:**  
*David Ulman, Lockheed Martin - Marietta*  
*Charles Babish, USAF, Aeronautical Systems Center, Engineering Directorate*  
*Nam Phan, USN, NAVAIR Patrol/Support/Rotary Wing Aircraft Strength Branch*  
*Jorge Gonzalez, USAF, Headquarters, Air Force Material Command, Engineering Directorate*
- 3:15 PM - 3:45 PM**      **BREAK**



## WEDNESDAY, 30 NOVEMBER 2005 (Continued)

3:45 PM - 5:30 PM

### PANEL SESSION

**"Addressing the NDI Crack-Miss Problem for Safety of Flight Structure"**

**Panel Chair:** *John Brausch*, USAF, Air Force Research Laboratory, Materials and Manufacturing Directorate

### Panel Members:

*Lt Col Larry Butkus*, USAF, Aeronautical Systems Center, Engineering Directorate

*Karl Kraft*, USAF, Oklahoma City Air Logistics Center, 76th Propulsion Maintenance Wing

*Capt John Schmidt*, USN, Operational Psychology Department, Naval Operational Medicine Institute

*John Goglia*, Center for Integrated Emergency Management, St. Louis University

## THURSDAY, 1 DECEMBER 2005

7:00 AM - 8:00 AM

**REGISTRATION/Continental Breakfast**

### **DESIGN PRACTICES**

Session Chair: *Paul Hoffman*, USN, NAVAIR, Structures Division

8:00 AM - 8:30 AM

**Advances in Testing and Analytical Simulation Methodologies to Support Design and Structural Integrity Assessment of Large, Monolithic Parts - A New Perspective**

*Robert Bucci\**, *Henry Sklyut* and *Larry Mueller*, Alcoa, Inc.;  
*Dale Ball*, Lockheed Martin Aeronautics Co.; and  
*J. Donald*, Fracture Technology Associates

8:30 AM - 9:00 AM

**The Aeroelastic Design and Testing of the F/A-22**

*William Anderson*, Lockheed Martin Aeronautics Co.

9:00 AM - 9:30 AM

**A Comparison of Civil and USAF Damage Tolerance Requirements**

*Robert Eastin*, FAA, Los Angeles California Office

9:30 AM - 10:00 AM

**BREAK**

### **FORCE MANAGEMENT APPROACHES**

Session Chair: *Alex Gaskin*, USAF, Warner Robins Air Logistics Center, C-5 Systems Program Office

10:00 AM - 10:30 AM

**C-5 Aging Fleet Integrity and Reliability Management (AFIRM)**

*Rich DiSalle*, Lockheed Martin Aeronautics Co.

10:30 AM - 11:00 AM

**Updating the C-130 Force Structural Maintenance Plan for Improved Fleet Management**

*Kenneth Taylor*, Mercer Engineering Research Center

11:00 AM - 11:30 AM

**C-130 Center Wing Inspection Developments**

*William Lockwood*, Mercer Engineering Research Center



## **THURSDAY, 1 DECEMBER 2005 (Continued)**

- 11:30 AM - 12:00 PM**      **Converting A-10A Extended Service DTA to AFGROW**  
*Paul Clark\*, Cassie Berry Fohn and Walter Besendorfer, USAF, Ogden Air Logistics Center, A-10 Systems Program Office*
- 12:00 PM - 1:30 PM**      **GROUP LUNCHEON**  
Speaker: *Col Michael Leahy, USAF, Air Force Research Laboratory, Director, Air Vehicles Directorate*  
"Structural Challenges for the Next Century of Flight"
- EXTENDING THE IN-SERVICE LIFE OF STRUCTURES**  
Session Chair: *Michael Blinn, USAF, Ogden Air Logistics Center, T-38 Systems Program Office*
- 1:30 PM - 2:00 PM**      **New Structural Guidelines for Dent Allowables on Fuselages**  
*Cornelis Guijt, USAF, US Air Force Academy*
- 2:00 PM - 2:30 PM**      **Aging Aircraft Repair Strategies Utilizing Cold Expansion Technologies**  
*Len Reid, Fatigue Technology Inc.*
- 2:30 PM - 3:00 PM**      **Development and Validation of an Inspectable Repair for Fuel Vent Hole Cracking in Integrally Stiffened Wing Skins and Extruded Spar Caps**  
*1st Lt Lawrence Ware\*, Mark Thomsen and Paul Clark, USAF, Ogden Air Logistics Center, A-10 Systems Program Office*
- 3:00 PM - 3:30 PM**      **BREAK**
- COMPOSITE STRUCTURES**  
Session Chair: *Jerry Turner, USAF, Oklahoma City Air Logistics Center, B-2 Systems Program Office*
- 3:30 PM - 4:00 PM**      **Enhancing Durability of Composite Joints and Attachments Using Expanded Hole Reinforcements**  
*Joy Ransom\*, Jude Restis and Len Reid, Fatigue Technology, Inc.*
- 4:00 PM - 4:30 PM**      **Application of the B-Spline Analysis Method to Composite Strength Prediction**  
*David Mollenhauer\*, USAF, Air Force Research Laboratory, Materials and Manufacturing Directorate and Endel Larve, University of Dayton Research Institute*
- 4:30 PM - 5:00 PM**      **On the Application of CRAS Technologies to Composite Repairs of USAF Aircraft**  
*Jeff Tom\* and Cong Duong, The Boeing Company*
- 5:00 PM - 5:30 PM**      **Structural Corrosion Management by Computational Simulation**  
*Christos Chamis, NASA Glenn Research Center*





## PARTICIPATING EXHIBITORS

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