FINAL PROGRAM

THE AIRCRAFT STRUCTURAL INTEGRITY PROGRAM CONFERENCE

DEC 1-3 2015
HYATT REGENCY, SAN ANTONIO, TEXAS
The 2015 Aircraft Structural Integrity Program (ASIP) Conference is specifically designed to bring together the world leaders in the area of aircraft structural integrity and to disseminate information of state-of-the-art technologies for aircraft structures in both the military and civilian fleets. This is the 31st Anniversary of the ASIP Conference in its current format, although similar meetings occurred in the 1970s. This year also marks the 57th anniversary of the publication of the initial requirements for the US Air Force’s Aircraft Structural Integrity Program.

ASIP 2015 will continue to provide a forum for the technical interchange of information between personnel responsible for structural integrity, including design, analysis, testing, manufacture, certification, non-destructive evaluation/inspection, maintenance, repair, safety, risk assessment and mitigation, durability and life management. This interchange helps provide the communication necessary to ensure that each community is aware of each other’s capabilities and needs. The ASIP Conference has become even more important to the Air Force, Navy, Army, NASA and the FAA due to the constantly growing emphasis on sustaining the airworthiness of aging aircraft.

ABOUT SAN ANTONIO

San Antonio has always been a crossroads for travelers, explorers, and those on a quest for liberty. Its sights, sounds, tastes and past captivate, while friendly people, the relaxing river, and a superb climate entice visitors to come back for more.

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Get The Latest Information about the ASIP Conference by following us on Twitter. This social media forum keeps information simple and to the point, allowing you quick access to resources you might not have known about. Including: details about guest speakers, conference registration and deadlines, the agenda, and info about our host city and headquarters hotel.
Mr. Ed Ingram, Lockheed Martin (Retired)
Lincoln Award Winner

Presentation Title: How the C-5A Forced Lincoln, Tiffany and the Air Force to Confront Widespread Fatigue Damage Early

Biography
Ed began his association with Lockheed in 1974 as a stress engineer on the C-130. He retired in 2013 after nearly 40 years of service. His career was spent entirely in the field of aircraft structures, but included varied assignments that resulted in experience in most of the structural sub-disciplines. At different times, he was involved in stress, fatigue, damage tolerance, finite element, structural dynamics and risk analysis.

By 1980, Ed was a Lead Engineer on the Durability and Damage Tolerance Analysis (DADTA) of the Air Force C-130s. In this assignment, he participated in developing many of the models and methods that would be used in the assessment and are still largely used on C-130 today. Throughout this project, the development and application of the methods were reviewed quarterly by Dr. Lincoln. Ed considers the interactions with Dr. Lincoln, over the course of several years on that project, to have been an invaluable learning experience.

Next, Mr. Ingram was assigned another DADTA Lead engineer responsibility. This time, in Burbank, California for the assessment of the SR-71, where once again he benefitted from technical interaction with Dr. Lincoln.

Over the next few years, Ed held engineering leadership positions on the C-5B and Special Projects. Following the 1986 Challenger accident, Ed supported NASA during the Space Shuttle Recertification. He continued to work with NASA on several structures research projects throughout the 1990s, culminating with the High Speed Civil Transport.

In the early 2000s, Lockheed Martin and the Air Force began the C-5M Program to modernize the C-5 with new engines and pylons, along with the avionics upgrades. Assigned once again to C-5, Ed served as Chief Technical Advisor and Chairman of the Fracture Control. In this time frame, the C-5 encountered several structural problems with stress corrosion cracking in a number of airframe components, including a major fitting called the Tiebox. The Tiebox problem led to Ed working again with Dr. Lincoln to find a solution that would maintain risk to safe levels until new fittings were available.
Mr. Ed Ingram Biography Continued

Following the peak of the C-5M work, Ed was asked to support the Widespread Fatigue Damage Assessment of the aging commercial transports, by preparing the Methodology Plan and by consulting throughout the assessment. In 2002, he was selected as a Technical Fellow, and in 2008, Senior Fellow. In these capacities, Ed was asked to provide engineering support to a number of projects, including F-22 and F-35. He was also honored to be a member of the writing team for revision C of Mil-Std-1530.

Ed has authored several technical papers as well as numerous Lockheed Martin engineering reports.

Mr. Ingram earned a B.S. in Aerospace Engineering from Auburn University and a M.S. in Aerospace Engineering from Georgia Tech. He and Jan have been married for 44 years, and are blessed with two wonderful daughters and seven amazing grandchildren.

Dr. Michael Gorelik, FAA - Tuesday Speaker

Dr. Michael Gorelik is the Chief Scientific and Technical Advisor for Fatigue and Damage Tolerance at the FAA. He has 25 years of experience in the areas of fracture mechanics, fatigue, damage tolerance, probabilistic methods and Six Sigma. He successfully applied this expertise to design and certification of aerospace products, fleet management and risk assessment, root cause analysis, material qualification, and coordination of R&D programs and consortia.

Prior to joining the FAA, Dr. Gorelik was an Engineering Fellow at Honeywell Aerospace working in the areas of life prediction and durability assessment of safety-critical components. His other leadership assignments included positions of Life Methods manager, Reliability and System Safety manager, and a project manager responsible for deployment of Aerospace-wide material data management system. Dr. Gorelik served as a principal investigator on a number of research programs funded by the FAA, US Air Force, NASA, DARPA and US Army. He authored over 50 peer reviewed papers and conference presentations, and one patent application. He chaired the AIA Rotor Integrity Sub-Committee (RISC) chartered by the FAA to address safety issues associated with material and manufacturing anomalies.
He also served as a Vanguard Chair for the IGTI Structures and Dynamics Committee, and the Chairman of the SAE G-11 Division.

He holds a number of professional certifications, and is a recipient of NASA TGIR and R&D 100 awards. He received a Ph.D. degree in Engineering Mechanics / Materials Engineering from the University of Illinois, and an MBA degree from the W.P. Carey School of Business (ASU).

Mr. Thomas A. Lockhart, USAF - Wednesday Speaker

Thomas A. Lockhart, a member of the Senior Executive Service, is Director, Materials and Manufacturing Directorate, Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio. He is responsible for more than 900 military and civilian personnel developing the next generation materials and manufacturing techniques for our nation’s defense.

Prior to his current assignment, Mr. Lockhart was the Deputy AF Program Executive Officer (PEO) for Tankers, Tanker Directorate, Air Force Life Cycle Management Center, Wright-Patterson Air Force Base, Ohio. He exercised oversight of developing, testing, fielding, and supporting the replacement aircraft for the KC-135.

Mr. Lockhart began his career in 1987 working as a journeyman engineer in training and simulation at Hill Air Force Base, Utah. He has served as an engineer, chief engineer, acquisition program manager, combatant command financial manager, group director, and deputy director for both Iraq Security Assistance Management and the Office of Security Cooperation, Iraq transition team.
MONDAY, NOVEMBER 30

12:00 PM – 6:00 PM  EARLY ONSITE REGISTRATION & CONFERENCE CHECK-IN

1:00 PM – 5:00 PM  TRAINING: DESIGN OF THE FULL STRENGTH, DAMAGE TOLERANT REPAIRS FOR METALLIC AIRCRAFT STRUCTURE: THE ART BEHIND THE SCIENCE

Instructors: Mr Scott Carlson - SwRI
Ms Rachel Heller - SwRI

TUESDAY, DECEMBER 1

7:00 AM  REGISTRATION/CONTINENTAL BREAKFAST

8:00 AM  WELCOME AND LINCOLN PRESENTATION AND AWARD

8:00 AM  Conference Welcome and Remarks
Mr James Rudd - Universal Technology Corporation

8:15 AM  How the C-5A Forced Lincoln, Tiffany and the Air Force to Confront Widespread Fatigue Damage Early
Mr Ed Ingram - Lockheed Martin Co (Retired)

9:15 AM  BREAK
9:45 AM  
**SESSION 1: OVERVIEWS I**  
Dr Ravinder Chona - USAF AFRL

9:45 AM  
Damage Tolerance for Life Management of Composite Structures - Part 1: Modeling  
Dr David Mollenhauer - USAF AFRL

10:15 AM  
Damage Tolerance for Life Management of Composite Structures - Part 2: Nondestructive Evaluation  
Dr Eric Lindgren - USAF AFRL

10:45 AM  
ADS-89-SP: A Standard Practice for U.S. Army Rotorcraft Structural Integrity Programs  
Dr Robert Benton - US Army Aviation Engineering Directorate

11:15 AM  
Digital Thread/Digital Twin Benefits Assessment  
Mr Joseph Lougheed - Lockheed Martin Co

11:45 AM  
**GROUP LUNCHEON WITH LUNCHEON SPEAKER**

12:15 PM  
Dr Michael Gorelik - FAA

1:30 PM  
**SESSION 2: PROGNOSTICS & RISK ANALYSIS I**  
Dr Eric Tuegel - USAF AFRL

1:30 PM  
Risk Assessments per DoD System Safety, USAF Airworthiness and USAF ASIP  
Mr Charles Babish - USAF Life Cycle Management Center

2:00 PM  
Risk-Shaping the Building Block Development Process for Certification of Composite Structure  
Mr LeRoy Fitzwater - The Boeing Co

2:30 PM  
Aircraft Structural Reliability under the Cumulative Effect of Structural Repairs  
Dr Mohammad Khalessi - PredictionProbe Inc

3:00 PM  
**BREAK**
3:30 PM  **SESSION 3: CHARACTERIZATION, MODELING & TESTING I**  
*Mr Jeffrey McFarland - The Boeing Co*

3:30 PM  **Comparing Starting Crack Size Estimates (EPS and EIFS) Based on the Same Experimental Crack Growth Life Data**  
*Dr Joseph Gallagher - Consultant*

4:00 PM  **Effective Corrosion Prevention Control Plans**  
*Mr Terry Gabbert - USAF AFRL*

4:30 PM  **Towards the Virtual Fatigue Test: A Hybrid Experimental/Numerical Approach**  
*Dr Albert Wong - Australian Defence Science & Technology Organization*

5:00 PM  **POSTER PRESENTATIONS IN THE EXHIBIT HALL (SEE DETAILS BELOW)**

5:00 PM – 7:00 PM  **EXHIBITOR RECEPTION IN THE EXHIBIT HALL**

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**2015 ASIP POSTER SESSION**

**Growth of Cracks from Small Naturally Occurring Material Discontinuities Under a Minitwist Spectrum**  
*Miss Dinaz Tamboli - Monash University*

**Relationship between Galvanic Corrosion and Local Plastic Deformation - A7050-T7451**  
*Dr Alberto Mello - Purdue University*

**Implementation Challenges for Small Fleet Structural Monitoring**  
*Dr Thomas Melia - Curtiss-Wright  Mr Scott English - Curtiss-Wright Controls Avionics & Electronics*

**Localized Peening Technology for On-Aircraft Repairs**  
*Ms Kelly McClurg - Avion Solutions Inc*
WEDNESDAY, DECEMBER 2

7:00 AM  REGISTRATION/CONTINENTAL BREAKFAST

8:00 AM  SESSION 4: OVERVIEWS II
Dr Lawrence Butkus - USAF AFRL

8:00 AM  Three Transport Aircraft ASIP Case Studies - The Australian Perspective
Mr Ross Stewart - QinetiQ

8:30 AM  B-1 Wing FSFT Progress and Lower Skin Trailing Edge DaDT Analysis
Mr Kwok Lee - The Boeing Co

9:00 AM  T-38 Wing Teardowns - Making a Molehill out of a Mountain
Dr Paul Clark - SwRI

9:30 AM  BREAK

10:00 AM  SESSION 5: LIFE ENHANCEMENT/REPAIR/REPLACEMENT CONCEPTS
Mr Scott Carlson - SWRI

10:00 AM  Fatigue Enhancement of a Critical A-10 Structural Detail Using Engineered Residual Stress
Dr Michael Hill - Hill Engineering LLC

10:30 AM  The Durability Assessment of a Short Edge Distance Cold Expanded Fastener Hole in a Fracture Critical F/A-18 Wing Attachment Bulkhead
Dr Simon Barter - Australian Defence Science & Technology Organization

11:00 AM  Finite Element Analysis of Bonded Repairs and Analysis Methods for the ASIP Engineer
Mr Lawrence Stoker - USAF

11:30 AM  B-1 Wing Repair - Unique Hole Geometry Cold Expansion Solutions
Mr Dean Madden - Fatigue Technology

12:00 PM  GROUP LUNCHEON WITH LUNCHEON SPEAKER

12:30 PM  Mr Thomas Lockhart - USAF AFRL/RX
1:45 PM  **SESSION 6: CHARACTERIZATION, MODELING & TESTING II**  
*Mr Kevin Welch - Lockheed Martin Co*

1:45 PM  **In Situ Thermoelastic Stress Analysis of the F-35 - An Improved Approach to Airframe Structural Model Validation**  
*Mr Marcus McDonald - Australian Defence Science & Technology Organization*

2:15 PM  **Determination of Vibratory Loads for the HH-60G Pave Hawk Helicopter**  
*Dr Robert McGinty - Mercer Engineering Research Ctr*

2:45 PM  **Process Induced Bulk Residual Stress Finite-Element Model and Validation Measurements of an Aluminum Alloy Forged and Machined Bulkhead**  
*Dr John Watton - Alcoa Technical Ctr*

3:15 PM  **BREAK**

3:45 PM  **SESSION 7: OVERVIEWS III**  
*Mr Marinus Bos - National Aerospace Laboratory NLR*

3:45 PM  **Hornet Outer Wing StAtic Testing (Howsat) Program for RAAF Classic Hornet Service Life Management**  
*WGCDR Benjamin Main - Royal Australian Air Force RAAF*

4:15 PM  **C-130 Full Scale Wing Durability Test with an ESL Wing: Coupon Test Program**  
*Dr Albert Arrieta - Lockheed Martin Co*

4:45 PM  **Long Term Viper: Flying the F-16 to 8000 Hours and Beyond!**  
*Dr Kimberli Jones - USAF F-16 ASIP*
THURSDAY, DECEMBER 3

7:00 AM   REGISTRATION/CONTINENTAL BREAKFAST

8:00 AM   SESSION 8: OVERVIEWS IV
Mr Robert Norcross - USAF HQ ACC

8:00 AM   B-52 Inboard Wing Teardown
Ms Jennifer Wilson - The Boeing Co

8:30 AM   F-16 Block 50 Full Scale Durability Test - Leveraging the Data
Mr Keith Sundstrom - Lockheed Martin Co

9:00 AM   Service Life Extension Program of the Aging Fighter Bomber Aircrafts
Mr Marcin Kurdelski - Air Force Institute of Technology Poland

9:30 AM   BREAK

10:00 AM  SESSION 9: NONDESTRUCTIVE INSPECTION/EVALUATION & STRUCTURAL HEALTH MONITORING
Mr John Brausch - USAF AFRL

10:00 AM  Using Data Analysis Techniques For Assessing New Nondestructive Inspection (NDI) Systems
Mr Gary Steffes - USAF AFRL

10:30 AM  Structural Health Monitoring, Risk, and Reliability
Mr David Forsyth - TRI/Austin

11:00 AM  Improving NDI Confidence
Mr Jacob Warner - USAF F-22 ASIP

11:30 AM   OPEN LUNCH
1:30 PM  

**SESSION 10: PROGNOSTICS & RISK ANALYSIS II**

Mr Michael Bouchard - UDRI

1:30 PM  

**Probabilistic Damage Tolerance using the FAA-Sponsored SMART|DT Software**

Dr Harry Millwater - University of Texas at San Antonio

2:00 PM  

**HH-60G Risk-Based Service Life Assessment**

Dr Nathan Branch - Mercer Engineering Research Ctr

2:30 PM  

**Probabilistic Risk Assessment - The SMART Approach To Continued Operational Safety**

Ms Beth Gamble - Textron Aviation

3:00 PM  

**BREAK**

3:30 PM  

**SESSION 11: CHARACTERIZATION, MODELING & TESTING III**

Dr Robert James - Northrop Grumman Corp

3:30 PM  

**Residual Stress Measurement using X-Ray Diffraction and Slitting Methods to Assess Significant Stress Corrosion Cracking in Extruded 7075-T651 Wing Skin Integral Risers on Australian Air Force P-3C Aircraft**

Dr Kevin Walker - Defence Science Technology Organization

4:00 PM  

**Flight Maneuver Recognition for the UH-1N Helicopter**

Dr Nathan Branch - Mercer Engineering Research Ctr

4:30 PM  

**Impacts on Crack Growth Analysis of Titanium 6Al-4V Small Crack Test Data**

Dr Ji Park - Lockheed Martin Co

5:00 PM  

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