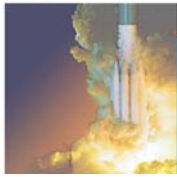


# Spacecraft and Launch Vehicle Dynamic Environments Workshop



## Program

The Aerospace Corporation  
El Segundo, California  
June 8-10, 2010

### TUESDAY, JUNE 8, 2010

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7:30 **Registration and Continental Breakfast**

8:30 **Morning Session**

**Welcome**

*Portia Peters, The Aerospace Corporation*

**Introduction**

*Charles L. Gustafson, General Manager, Vehicle Systems Division, The Aerospace Corporation*

**Keynote Address**

*Brian Muirhead, Chief Engineer, Jet Propulsion Laboratory*

**Status and Design Features of the NASA GRC Mechanical Vibration Facility**

*Kim D. Otten, Vicente J. Suarez, and Dzu K. Le, NASA Glenn Research Center*

**Status and Design Features of the New NASA GRC Reverberant Acoustic Test Facility**

*Mark E. McNelis, William O. Hughes, Aron D. Hozman, and Anne M. McNelis, NASA Glenn Research Center*

10:30 **Break**

10:45 **Lift-Off Acoustics Prediction of Clustered Rocket Engines in the Near Field**

*Bruce T. Vu, NASA Kennedy Space Center; Ken J. Plotkin, Wyle Laboratories*

**Risk Reduction Project in Pad Abort 1 Launch Vehicle Vibroacoustic Loads**

*Sasan C. Armand, NASA Langley Research Center*

**Acoustic Attenuation from Contamination Bagging – Fact or Fiction?**

*Joe Hackel, Ball Aerospace; Mike Van Dyke, The Aerospace Corporation*

12:15 **Lunch Provided**

1:15 **Afternoon Session**

**Problems and Opportunities Associated with Large Order Finite Element Models**

*Robert N. Coppelino, Measurement Analysis Corporation*

**Modal Test Data Adjustment for Interface Compliance**

*Ryan E. Tuttle and Jeffrey A. Lollock, The Aerospace Corporation*

**Accurate Determination of the Impact of Interface Deadband Nonlinearities on Component Transient Environments**

*Sagar Vidyasagar and Sundeep Bhatia, Lockheed Martin Corporation; Vincent Fogt, NASA Johnson Space Center; Arya Majed and Ed Henkel, Applied Structural Dynamics, Inc.*

**Accurate Determination of Transient Flight Loads for Foam Packed Payloads**

*Sundeep Bhatia, Sagar Vidyasagar, Simeon Powell, and Jerry McDonald, Lockheed Martin Corporation; Paul Gibbons and Eric Stagner, Teledyne Brown Engineering*

3:15 **Break**

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### Afternoon Session (continued)

- 3:30 **Advances in the Assessment of Base-Drive Sine Vibration Test Data**  
*Adriano Calvi, European Space Agency; Sébastien Laborde, EADS Astrium Satellites*
- Simulation of Sinusoidal Vibration Testing in a Large Shaker Facility**  
*Elliot Haag and Paul Blleloch, ATA Engineering, Inc.; Kim Otten and Damian Ludwiczak, NASA Glenn Research Center*
- Rapid Coupled Loads Analysis and Spacecraft Load Reduction Using SoftRide**  
*Raman Johal, CSA Engineering, Inc.*
- Boundary Element Method Data Analysis Processing: Comparison of Analysis Bandwidth Reduction Methods**  
*Jeffrey Larko and Mark McNelis, NASA Glenn Research Center; Bryce Gardner, ESI*

## WEDNESDAY, JUNE 9, 2010

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- 7:30 **Registration and Continental Breakfast**
- 8:30 **Morning Session**
- Margin and Uncertainty in the Energy Framework**  
*Tim Edwards, Sandia National Laboratories*
- Uncertainty Margin Issues When Using Vibro-Acoustic Modeling to Define Maximum Expected Environments**  
*Matt Kaplan and Paul Bremner, ATA Engineering, Inc.*
- End to End Uncertainty within the Loads and Environments Analyses of NASA's Constellation Program**  
*Isam Yunis, NASA Langley Research Center*
- 10:00 **Break**
- 10:15 **Accounting for Uncertainties in Coupled Loads Analysis**  
*Ayman Abdallah and Timothy Widrick, NASA Kennedy Space Center*
- Managing Uncertainty of Dynamic Environments for the Orion CEV**  
*Adam Wigdalski, Lockheed Martin Space System Company*
- Incorporation of Uncertainties in the Mars Science Laboratory Rover Loads Analysis**  
*Chia-Yen Peng, Mike Lih, and Gary Ortiz, Jet Propulsion Laboratory*
- 11:45 **Lunch Provided**
- 1:00 **Afternoon Session**
- Panel Session: End to End Uncertainties**  
*Moderator – Ali Kolaini*

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### Afternoon Session (continued)

2:00 **Pleiades Mechanical Qualification**

*R. Redondo, V. Albouys, and S. Mary, CNES; A. Soler, Thales Alenia Space; and P. Corberand and N. Larue, EADS Astrium (Presented by Jean-Noel Bricout, CNES)*

**Assessment of Shock Environments for the SDO and LRO Missions**

*Scott Gordon, NASA Goddard Space Flight Center*

3:00 **Break**

3:15 **Modeling of the High Frequency Pyroshock Response Based on Elastic Wave Propagation Analysis**

*Shyh-Shiuh, Mike Lih, and Ali R. Kolaini, Jet Propulsion Laboratory*

**The Validation of Pyroshock Data**

*Vesta I. Bateman, Mechanical Shock Consulting*

**Comparison of Piezoelectric Accelerometer and Laser Doppler Vibrometer Measurement for a Pyroshock Test**

*Alex Hardt, Orbital Sciences Corporation*

**Detection of Data Corruption by Out-of-Band Noise Using Higher Order Spectral Analysis**

*Tim Edwards, Sandia National Laboratories*

## THURSDAY, JUNE 10, 2010

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7:30 **Registration and Continental Breakfast**

8:30 **Morning Session**

**Derivation of Orion Launch Abort Vehicle Loads for Abort Test Booster Separation**

*Parthiv N. Shah, Allison Hutchings, and Paul G. Bremmer, ATA Engineering, Inc.*

**CDR-Level Structural Modeling and Optimization of the Mercury Sodium Atmosphere Spectral Imager**

*Joao Ricardo, Active Space Technologies; Dr. David Rees, Hovemere, Ltd.; Dr. Shingo Kameda, Japan Aerospace Exploration Agency; and Dr. Ichiro Yoshikawa, University of Tokyo*

**Fluid-Structure Interaction Analysis of Launch Vehicle Boost Phase of Flight**

*Kirk W. Dotson and Brian H. Sako, The Aerospace Corporation; Daniel R. Morgenthaler, United Launch Alliance*

10:00 **Break**

10:15 **Force Limited Vibration Testing of the JWST FGS OA**

*Yvan Soucy, Canadian Space Agency; Peter Klimas, COM DEV Canada*

**Whole Spacecraft Isolation System for Ground Based Stability Testing**

*Scott Pendleton, CSA Engineering*

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### Morning Session (continued)

#### Modeling Reverberant Chamber Effects on Acoustic Test Results

*Paul Belloch and Lina Li Maricic, ATA Engineering, Inc.; and Ed Porth, ATK Aerospace Systems*

11:45 **Lunch on your own**

1:00 **Afternoon Session**

#### A Review of Mass-Loaded Support Structures Random Vibration Prediction Methodologies

*Ali R. Kolaini, Jet Propulsion Laboratory; Terry D. Scharton, Consultant; and Dennis L. Kern, Jet Propulsion Laboratory*

#### Improving Methods for Predicting Vibration Response Due to Local Separated Flow Conditions

*Paul Belloch and Allison Hutchings, ATA Engineering, Inc.; and Craig Streett, NASA Langley Research Center*

#### Direct Field versus Reverberant Acoustic Testing of a Spacecraft-Like Structure

*Gordon Maahs, Applied Physics Laboratory*

#### Practical Application of Structural-Acoustic Modeling Techniques, Including a Comparison of BEM Analysis Results versus Experimental Data

*Benjamin J. Doty and Ali R. Kolaini, Jet Propulsion Laboratory*

3:00 **Break**

3:15 **Ares IX Hybrid Modeling with Comparisons to Flight Data**

*Daniel Niedermaier, Boeing/NASA Johnson Space Center*

#### Experimental Measurement of Structural Vibroacoustic Properties of Panels

*Cory Rupp and Doug Knox, ATA Engineering, Inc.*

#### Low and High Frequency Models of Response Statistics of a Cylindrical Orthogrid Vehicle Panel to Acoustic Excitation

*Andrew Smith, NASA-MSFC; Bruce LaVerde, ERG; David Teague, Jacobs Engineering; Bryce Gardner and Vincent Cotoni, ESI Group*

### Adjourn