

## **CALCE Electronic Products and Systems Center Technical Review and Planning Meetings**

**Ashok K. Sharma**  
**NASA/Goddard Space Flight Center**

**Marcellus Proctor**  
**NASA/Goddard Space Flight Center**

### **Computer Aided Life Cycle Engineering (CALCE) Technical Meetings Overview**

A bi-annual CALCE Consortium Technical Review and Planning Meeting was held at the University of Maryland, College Park, MD campus on October 9-11, 2001. The main purpose of this meeting was to present to the CALCE consortium members, the status of on-going research in electronic component testing and packaging; including effects of environmental stresses on reliability, Computer Aided Life Cycle Engineering and Physics of Failure (PoF) models. The technical review meetings were divided into two sections, with the first two days devoted to presenting of status of on-going (Year 2001) projects, and the third day reserved for Year 2002 project proposals.

The CALCE research program theme is focused on the identification and development of technologies, methodologies, and guidelines for assessing, mitigating, and managing the risks associated with the design, manufacture and fielding of electronic products and systems. This past year, under consortium project C01-05, CALCE has been working on creating a guidebook for Plastic Encapsulated Microcircuits (PEMs). This guidebook provides information useful in assessing the reliability of PEMs in high altitude applications, especially those involving exposure to rapid altitude cycling. The CALCE webbooks are continuing to be refined and updated with information and test results, as they become available from the projects.

Several on-going projects at CALCE, as well as the ones proposed for 2002, have a NEPP Area of Emphasis (AOE) associated with it. Examples for both the current year (2001) and the projects proposed for 2002, along with the NEPP Areas of Emphasis are listed below.

#### CALCE Current Projects (Year 2001)

1. [Guidebook on the Use of PEMs at High Altitudes and in Space](#) – Extreme Environment Electronics and Packaging
2. Integral and Integrated Passives Web Book Update (3 parts) - Substrates and Embedded Passives Technologies
  - [Part 1](#)
  - [Part 2](#)
  - [Part 3](#)

3. [Effect of Proof Testing on Optical Fiber Fusion Splices](#) – Photonic Systems and Devices
4. [MEMS Sensors and Carrier-Level Reliability](#) – MEMS/MOEMs Reliability Assurance
5. [Compatibility of Current Components with Lead-Free Solder Reflow Profiles](#) – Advanced Interconnect Reliability

#### CALCE Proposed Projects (Year 2002)

1. [Reliability of Optical Interfaces to MEMS](#) – MEMS/MOEMs Reliability Assurance & Photonic Systems and Devices
2. [Embedded Passive Reliability and Tradeoff Analysis](#)- Substrates and Embedded Passives Technologies
3. [Guidelines and Improvements for Conducting Virtual Qualification \(CADMP-II/calcePWA\)](#) - Development of Innovative Qualification Methods
4. [Virtual Qualification of Power Components and Modules](#) - Development of Innovative Qualification Methods
5. [Thermal Management Solutions for Low Volume Complex Electronic Systems \(LVCES\)](#) – Thermal Management for Reliability
6. [Radiation Induced Failure Mechanisms and Preventive Shielding of Electronic Parts](#) - Radiation Hardness Assurance

#### Future Events:

The next bi-annual CALCE Consortium Technical Review and Planning Meetings will be held in March 2002. An agency-wide subscription for CALCE Consortium Membership for all NASA Centers is in process of implementation. Additional details about CALCE activities and projects are available at <http://www.calce.umd.edu>