CALCE becomes an information resource for NASA

The National Aeronautics and Space Agency (NASA) Electronic Parts and Packaging Program (NEPP) and Computer Aided Life Cycle Engineering (CALCE) Electronic Products and Systems Center have formed a collaborative partnership to conduct research and develop strategies and methodologies for selecting and evaluating electronic parts and packaging technologies on future NASA projects and missions. The NEPP/NASA program will focus on making the CALCE research and software available to NASA engineers through the NEPP Information Management and Dissemination program (or ‘virtual’ merging the CALCE research and software with the NEPP Information Management and Dissemination resources). Selected NASA engineers will undergo training at CALCE on the use and application of CALCE tools and on several strategies for improving the quality of parts selection and qualification processes and procedures.

The CALCE Center, based at the University of Maryland, was established in 1986 under a NSF program and operates through the industry sponsored research. The center and its original six industry sponsors formed the CALCE Consortium with a mission to create a knowledge and resource base for the development of competitive electronic components, products and systems. Today the CALCE Consortium consists of over forty companies and agencies from all over the world, and represents the full breadth of the electronics industry including automotive, avionics, consumer, semiconductor, telecommunications as well as government agencies. The CALCE research program has also expanded and is committed to developing a comprehensive methodology for achieving quality and sustainability of electronic systems. This research effort is organized by three primary thrusts: Failure Identification and Reliability Modeling, Environment and Operational Assessment of Products, and Risk-Informed Technology Insertion Methodologies with current research efforts focused on the use of lead-free solder, parts management, the effect of impact on portable electronics and simulation techniques to virtually qualify electronics. With over 15 years of research, CALCE has compiled resources on such issues as the use of plastic parts in high reliability applications, durability of ball grid arrays (BGAs) and chip scale packages (CSPs) and guidelines for developing high temperature electronics. In conducting research, CALCE has always emphasized the examination of the fundamental physical principles which cause failure, for which the group coined the phrase “physics of failure”. In striving to provide the best possible service to CALCE sponsors, the Center underwent the process of becoming ISO certified and received the Certificate of Registration for ISO 9001 in December of 1999.

The collaboration between NASA and CALCE will afford NASA engineers the opportunity to interact with CALCE and gain access to CALCE web resources. The CALCE website contains some of the world’s most advanced reliability assessment and virtual qualification software: calcePWA and CADMP II. It provides the guidelines for a silicon-to-system accelerated product qualification, and a wide collection of resources such as journal articles, technical reports, web-based textbooks that cover areas of critical importance in electronic product and system development. Further, guidelines for solder joint fatigue analysis, cost analysis and supply chain management are available through the website. To request such access, fill out an online form at: www.calce.umd.edu/account_request.html. For more information on the program, contact Dr. Michael Osterman, osterman@calce.umd.edu, or Ashok Sharma, asharma@pop300.gsfc.nasa.gov.