SANTA CLARA UNIVERSITY

Department of Mechanical Engineering

Mechanical Engineering Seminar Series

Engineering at Moog CSA, Histories and achievements of the past decades

Joe Maly (Associate Principal Engineer and ESPA Product Manager)
Brad Allen (Associate Principal Engineer)
Moog CSA

Date: Wednesday, January 11, 2017
Time: 4:00 – 5:00 pm
Location: Bannan Engineering, EC 326

Abstract

This presentation features background on Moog CSA and describes selected engineering program histpries over the past decade. Examples include solar array dampers for Hubble Space Telescope and Landsat-8, hardware for the thrust oscillation environment of Area I, jitter mitigation for the ASTRO-H telescope, and development of a propulsive ESPA (Orbital Maneuvering Vehicle, or OMV) for launch and orbital deployment of small satellites. Case studies are presented from the persecptive of the engineer.

CSA Engineering was founded in 1982 as an employee owned small business to provide services in structural dynamics with a focus on vibration suppression. The founders were established members of the dynamics community, having developed design tools for vibration damping using finite element analysis supported by cutting edge dynamic test methods to evaluate damping and isolation systems. The company grew slowly but steadily during the 80s and 90s, and in 1993 an active systems group was added to round out the corporate capability; CSA became known around the world for active and passive solutions for systems ranging from space and aircraft, to semiconductor manufacturing and medical equipment, to optical systems including ground-based telescopes. Also in the mid-90s a focus was established to develop recurring products related to structural dynamics; spaceflight hardware was targeted and the organization achieved AS9100 status to enable product development for the large aerospace primes. Early flight programs included damping and isolation systems for the Hubble Space Telescope both on-orbit and to protect replacement equipment during the launch of the HST Servicing Missions. In 1998, CSA pioneered the new field of whole-spacecraft vibration isolation, isolating entire satellites (instead of just components) from the harsh vibration environment of launch; since that time SoftRide isolation systems have flown on 38 launches on vehicles ranging in size from Minotaur I to Delta IV Heavy. Also in 1998, CSA began development of the EELV Secondary Payload Adapter (ESPA) which has become the standard for small satellite access to space, establishing CSA as a provider of payload launch accommodations. In 2002, CSA Engineering was named Small Business Contractor of the Year by the Small Business Administration. In May 2008, CSA Engineering was acquired by Moog Inc., a worldwide designer, manufacturer, and integrator of precision motion control products and systems. As a business unit of Moog's Space and Defense Group, Moog CSA has continued to grow and expand its footprint in the world of structural dynamics, now supported by a global marketing organization with strong relationships across the space community.

Santa Clara University

Biography

Joe Maly, Associate Principal Engineer and ESPA Product Manager:

Joe is a senior member of the Moog CSA technical staff and is Moog product area lead for payload launch adapter systems. He joined CSA in 1987 and since 1993 has led flight hardware and vibration suppression programs. Experienced in both analytical and experimental methods of structural dynamics, Joe has developed vibration suppression hardware for space structures, aircraft, medical equipment, and semiconductor manufacturing equipment. He was Principal Investigator for the development of ESPA, the EELV Secondary Payload Adapter, and he led the flight hardware program for the Hubble Space Telescope Solar Array Dampers. Recently Joe led the Orbcomm Generation 2 (OG2) Satellite Dispenser team supporting the launch of multiple satellites with ESPA on Falcon 9 to populate the OG2 constellation. Currently he is working with the Moog Orbital Maneuvering Vehicle (OMV) team to develop propulsive ESPA vehicles for orbital deployments and satellite staging. Joe has a BS in Mechanical Engineering from the University of Cincinnati and an MS in Applied Mechanics from Stanford University.

Brad Allen, Associate Principal Engineer at Moog CSA:

Mr Allen has worked for 34 years in the area of sound and vibration testing and damping design. He received a BSME from University of Cincinnati in 1986 in their cooperative education program. Working with Anatrol Corporation, he developed solutions to sound and vibration conditions, primarily in the automotive industry. After graduating, Mr Allen went to CSA Engineering as their sixth engineer in 1986. Mr Allen worked with CSA's viscoelastic material (VEM) characterization engineer to find VEMs that are suitable for launch and space applications and to measure and document their dynamic mechanical performance in a database. Mr Allen also developed processes in their structural dynamics laboratory performing dynamic mechanical tests on components, modal testing, shock testing, and diagnostic test services. Today, Mr Allen is a staff engineer at Moog CSA. He solves sound and vibration conditions mostly for precision motion applications in defense, space, and other industries. He commonly designs vibration isolation and damping solutions and documents their performance by test. Mr Allen received an MSME with a focus in dynamics and controls from Santa Clara University in 2000.