

MATERIALS AND STRUCTURES SYMPOSIUM (C2)  
Space Structures - Dynamics and Microdynamics (3)

Author: Dr. Durval Zandonadi Jr.  
Instituto Nacional de Pesquisas Espaciais (INPE), Brazil, durval@lit.inpe.br

Mr. Mauro Sakita  
Instituto Nacional de Pesquisas Espaciais (INPE), Brazil, sakita@lit.inpe.br

BENEFITS AND CONSTRAINTS IN REPLACING LOW-EFFICIENCY WATER-COOLED LINEAR  
POWER AMPLIFIERS BY NEW AIR-COOLED CLASS-D AMPLIFIERS FOR DRIVING VIBRATION  
TESTING SYSTEMS

**Abstract**

By mid-2011 the Integration and Testing Laboratory (LIT) of the Brazilian National Institute for Space Research (INPE) carried out an upgrade on two modular power amplifiers used to drive electrodynamic vibration test systems (VTS) in operation since 1987. This article presents the benefits and constraints experienced by the dynamic testing staff when employing the new digital switching-type (Class-D) amplifiers coupled with the shakers. By installing amplifiers with the latest technology and improved efficiency, energy costs are greatly reduced, the shaker systems are revived, and the equipment's useful life extended. In addition there is an increase in the performance of random and shock tests, and there is no need of matching transformers anymore. On the other hand, background noises and interferences have to be studied and managed since these new systems are noisier than the old ones, and have greatly interfered with the remaining linear power amplifier. The proposed solution to mitigate the interference problems is also analyzed and presented.