Environmental Verification Standards for Space Hardware

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To capture and transfer knowledge, the Jet Propulsion Laboratory prepared a set of documents that support the development of products for use in space and products that support ground and space operations. JPL’s Flight Project Practices include design and verification practices that demonstrate environmental compatibility. Two examples include:

- At the system level, the baseline environmental verification program includes modal, static, random vibration, acoustic, thermal, electromagnetic interference/ electromagnetic compatibility, and pyro shock tests.
- At the assembly/subsystem level, the baseline environmental verification program includes random vibration, acoustic, thermal, electromagnetic interference/ electromagnetic compatibility, pyro shock, and atmospheric tests, as well as analyses for radiation and micrometeoroids.

To implement these practices, three environmental requirement standards were developed: one for system dynamics testing, one for system temperature testing, and one for assembly/subsystem environmental verification. In this paper, the process used to develop these standards is described, a summary of the requirements is presented, and the lessons learned during the activity are provided.