

This standard includes selected environmental exposure tests for hardware operating in earth orbit. The tests included are generally regarded as the most critical and the ones having the highest cost and schedule impact. This standard also includes functional demonstration tests necessary to verify the capability of the hardware to perform its intended function (with and without environmental exposure as appropriate). This standard specifies test levels, factors, margins, durations, and other parameters where appropriate. In some cases, these specifics are expressed statistically or are referenced in other NASA standards.

1.2 Purpose. This standard provides a NASA-wide common basis from which test programs shall be developed for NASA payloads. The document defines a standard set of flight hardware test requirements, which provide the necessary verification of design adequacy and flight worthiness of NASA spacecraft. Compliance provides consistency across the Agency and its contractors, facilitating the sharing of hardware between Centers and programs. Compliance also provides a basis for establishing a baseline pedigree for the "qualification by similarity" evaluation process for "heritage" hardware without the need to consider the variability of test requirements.

1.3 Applicability. This standard recommends engineering practices for NASA programs and projects. This standard may be cited in contracts and program documents as a technical requirement or as a reference for guidance. Determining the suitability of this standard and its provisions is the responsibility of program/project management and the performing organization. Subject to approval by the assigned Technical Authority, individual provisions of this standard may be tailored (i.e., modified or deleted) by contract or program specifications to meet specific program/project needs and constraints. This standard applies to all NASA payload hardware developed in-house or under contract that is launched on expendable or reusable launch vehicles (both free-flyer and attached payloads). The levels of assembly for which the standard applies are the payload, modular subsystem (which includes large instruments), and component levels. Small instruments may be treated as components. This standard excludes payloads launched on sounding rockets, balloons, and aircraft, as well as the launch vehicle hardware itself. This standard is developed for the typical NASA protoflight payload wherein one payload is built and serves to qualify the design and is also the flight article. This standard recognizes the need to define the mission-unique environment for each test discipline. This environmental definition shall ensure the tailoring of test requirements to the environmental envelope encountered during the payload's total lifetime considering phases such as ground handling, launch, and in-space operations. The principal objective of the test program is to demonstrate the system's ability to collect scientific data and perform specific remote operations, rather than meet rigid general requirements. Certain environments and functions cannot reasonably be simulated on earth because of factors such as size, zero-gravity limitations, and interface boundary conditions. Tailoring the test program, with supplemental analysis, is appropriate in such cases. When tailoring is utilized or when deviations are deemed necessary, the project manager and the assigned Technical Authority shall review and approve such tailoring and deviations and assure that a documented record, including the rationale, is maintained. This standard is generally not retroactive from the approval date for hardware already under contract.

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