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DESIGN GUIDELINES FOR ASSESSING AND CONTROLLING SPACECRAFT CHARGING EFFECTS

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Experience has indicated a need for uniform criteria, or guidelines, to be used in all phases of spacecraft design. Accordingly, guidelines have been developed for the control of absolute and differential charging of spacecraft surfaces by the lower energy (less than approximately 50 keV) space charged-particle environment. Interior charging due to higher energy particles was not considered. The guidelines have been compiled into a NASA Technical Paper entitled "Design Guidelines for Assessing and Controlling Spacecraft Charging Effects," NASA TP-2361.

The document is divided into five sections: (1) spacecraft charging concepts of importance to the designer, (2) the modeling techniques to be used to assess whether the design is adequate for environmental immunity, (3) specific guidelines for protecting systems and subsystems, (4) test procedures for demonstrating system immunity, and (5) active charge control and monitoring techniques. Appendixes present illustrative examples and the bibliography lists other documents for those desiring further information on specific topics.

The design guidelines document is to be regarded as a guide to good practices for assessing and controlling charging effects. It is not a NASA or Air Force mandatory requirement unless specifically included in project specifications. It is expected, however, that this document, revised as experience may indicate, will provide uniform design practices for all space vehicles. Copies can be obtained by contacting Carolyn K. Purvis.