APPENDIX D

Performance Assurance Approach for MIDEX Missions

Reliability considerations for the MIDEX Program are bounded by programmatic demands for scientific excellence, low cost, and rapid development. As a result, systems are expected to be predominantly nonredundant or "single string." However, redundancy is encouraged where appropriate and where resources allow.

The performance assurance requirements for the MIDEX Program will be structured to accept the increased risk that is inherent in a predominately non-redundant system. Good quality parts and materials, a limited reliability and quality program, and significant reliance on the test program will be key factors in balancing reliability goals against program cost and complexity constraints.

The Principal Investigator has responsibility and control over development of the instrument(s) and, in the "PI-Mode," the spacecraft. Only limited support is planned by NASA, with emphasis on those activities that contribute most to product reliability and integrity. Deliverable documentation is reduced, provided the investigator maintains adequate internal records that demonstrate traceability when needed.

The performance assurance requirements for the MIDEX Program recognize a wide variation in complexity, size, and technology of proposed instruments and spacecraft; these all can affect program risk and costs. The requirements recognize that there are significant differences in the availability to investigators of facilities, skills, and supporting capabilities. The performance assurance program ensures that hardware and software are designed, manufactured, and tested to flight standards, and that drawing and specification requirements are met. Guidelines and requirements for conducting an appropriate performance assurance program are contained in the Medium Explorer Performance Assurance Requirements (PAR) document, available from the Explorers Project Library (see section VIII.H of the body of this AO).

The proposer should refer to the PAR in developing his performance assurance approach and realistically addressing the costs associated with these tasks. During the definition phase of the mission the specific implementation details of the performance assurance program for the investigation will be negotiated. The quality program shall be modeled after ANSI/ASQC Q9001-1994, "Quality Systems - Model for Quality Assurance in Design, Development, Production, Installation, and Servicing".

As part of the proposal submitted in response to this AO, a brief, 2-3 page description of the proposed approach to performance assurance is required. The performance assurance description should reflect the proposer's understanding of and approach to accomplishing the performance assurance requirements contained in the PAR. The description should also provide the basis for the performance assurance costs contained in the Proposal. The proposer is encouraged to make maximum use of existing practices and procedures in developing and implementing the performance assurance program. For requirements that are not fully applicable, because of a particular aspect of the instrument or mission, the proposer should provide appropriate rationale. The proposer may also offer an alternate method of meeting the intent of a requirement when such a method is better aligned with the manner in which the total work is to be accomplished. The proposer must describe the plans for maintaining adequate internal documentation for all performance assurance activities and for providing NASA with essential deliverable documentation.