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RELIABILITY AND QUALITY ASSURANCE PUBLICATION

**INSPECTION SYSTEM PROVISIONS
FOR
AERONAUTICAL AND SPACE SYSTEM
MATERIAL, PARTS, COMPONENTS AND SERVICES**

NASA

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

PREFACE

Date: July 1971

This publication establishes general requirements for inspection systems to ensure the required high quality of materials, parts, components and services for NASA aeronautical and space systems.

NASA Installations shall invoke the requirements of this publication contractually to the extent needed and consistent with programs, projects and procurement situations. NASA system contractors may invoke the requirements of this publication contractually upon their suppliers consistent with prime contract provisions. Suppliers may invoke this publication on their suppliers as appropriate and to the extent necessary to ensure the required quality of purchased materials, parts and components.

When this publication, or portions thereof, is invoked in a subcontract, the terms "NASA" and "contractor" are deemed to be replaced by the terms "contractor" and "supplier", respectively, and the term "contract" is deemed to be replaced by the terms "subcontract or "purchase agreement." However, the term "NASA" is not so replaced in situations involving direct prerogatives of the Government (e.g., 1C102).

Questions concerning application of this publication to specific NASA contracts shall be referred to the procuring NASA Installation or its designated Government quality representative. General questions concerning this publication shall be referred to the Reliability and Quality Assurance Office, NASA Headquarters, Washington, D.C. 20546.

Copies of this publication are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

NPC 200-3, April 1962 Edition, is hereby canceled.

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Reliability & Quality
Assurance

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ORGANIZATION OF THE R&QA MANUAL OVERALL COVERAGE

The Reliability and Quality Assurance Manual - referred to as the "R&QA Manual" - is the overall generic title which identifies all NASA R&QA management publications published under the basic R&QA subject classification code. The publications are grouped by major subject breakdown and further divided into specific categories identified as Parts. These Parts (not a complete R&QA. Manual) are published as individual R&QA publications.

The following list shows the grouping and present plan for publishing the individual R&QA publications:

Part	Title	Assigned No.
<u>Volume I - General Provisions</u>		
A	Reliability Program Provisions for Aeronautical and Space System Contractors (Formerly NPC 250-1)	NHB 5300.4(1A)
B	Quality Program Provisions for Aeronautical and Space System Contractors (Formerly NPC 200-2)	NHB 5300.4(1B)
C	Inspection System Provisions for Aeronautical and Space System Materials, Parts, Components, and Services (Formerly NPC 200-3)	NHB 5300.4(1C)
<u>Volume 2 - Government Agency Provisions</u>		
A	Management of Government Quality Assurance Functions for Supplier Operations	NHB 5330.7
B	Quality Assurance Provisions for Government Agencies	N/A
<u>Volume 3 - Standards</u>		
A	Requirements for Soldered Electrical Connections (Formerly NPC 200-4)	NHB 5300.4(3A.)
C	Line Certification Requirements for Microcircuits	NHB 5300.4(3C)
D	Test Methods & Procedures for Microcircuit Line Certification	NHB 5300.4(3D)
E	Radiographic Inspection for Microcircuits	NHB 5300.4(3E)

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CHAPTER 1: INTRODUCTION

1C100 GENERAL

This publication sets forth inspection system requirements for the procurement of materials, parts, components, and services for aeronautical and space systems. These requirements provide for an effective system to ensure that contractual quality requirements and technical criteria are satisfactorily met.

1C101 RELATION TO OTHER CONTRACT REQUIREMENTS

The requirements set forth in this publication shall be complied with in addition to all detail requirements contained in other parts of the contract. In the event that the requirements of this publication conflict with or duplicate other contractual requirements, the contractor shall bring such conflict or duplication to the attention of NASA for resolution.

1C102 ACTIONS AND PREROGATIVES OF THE GOVERNMENT

The operations and work of contractors and suppliers are subject to evaluation, review, audit, survey and inspection by NASA or its designated Government quality representative. Surveys or audits may be made prior to or after issuance of a contract. The contractor or supplier will be notified of deficiencies. The contractor or supplier shall follow-up and ensure that deficiencies are promptly corrected.

1. ***Designated Government Quality Representative.*** Government quality representatives (hereinafter referred to as Government representative(s), may be assigned on a resident or itinerant basis at the contractor or supplier's facilities. The responsibilities and authorities delegated to these representatives will be defined by the NASA Contracting Officer.
2. ***Support To Designated Government Quality Representatives.*** The contractor or supplier shall provide the Government representative with information, documents, records, inspection equipment, samples, materials and reasonable facilities and assistance for the safety and convenience of the representatives in the performance of duties.

1C103 QUALITY DOCUMENTS

1. Appendix A, "Quality Documents Cross-Reference Index," lists documents cited in this publication. The contract will specify those documents to be submitted to NASA or its representative, the times and frequency of submittal and whether they are to be submitted for approval, review or information. However, all documents used for contract performance shall be readily available to NASA and its Government representatives.

2. Government and contractor actions for submitted documents and their revisions are as follows:

- a. **Approval.** Documents in this category require written NASA approval prior to use. Receipt by NASA shall occur within the time specified in the contract. Requirements for resubmission shall be as specified in letter(s) of disapproval.
- b. **Review.** Documents in this category require receipt by NASA prior to use and within the time period specified in the contract. They are subject to evaluation by NASA, or its designated representatives to determine contractor effectiveness in meeting contract objectives. When Government evaluations reveal inadequacies, the contractor will be requested to correct the documents.
- c. **Information.** Documents in this category require receipt by NASA within the time period specified in the contract for the purpose of determining current status, progress, and future planning requirements.

1C104 GLOSSARY OF TERMS

Appendix B, "Glossary of Terms", defines selected terms utilized in this publication.

1C105 MATERIAL REVIEW BOARD

Appendix C, "Material Review Board", sets forth procedures for conducting Material Review Board activities. The referencing or incorporation of this publication, including Appendix C, in a contract does not, by itself, constitute authorization to conduct Material Review Board activities. The operation of a Material Review Board must be expressly authorized by NASA in the contract. The authority for suppliers to conduct Material Review Board activities must be set forth in subcontracts or purchase agreements.

CHAPTER 2: BASIC INSPECTION SYSTEM REQUIREMENTS

1C200 GENERAL

The contractor shall maintain an effective inspection system, which shall include provisions for defining and verifying article and material quality throughout all operations including procurement, fabrication, test and delivery. The system shall ensure the maintenance of objective evidence of quality in the form of records of inspections and test results. The system shall also ensure that any unsatisfactory conditions are discovered and documented and that remedial and preventive actions are taken at the earliest possible time.

1C201 INSPECTION SYSTEM PLAN

An Inspection System Plan shall be prepared and submitted as required by the contract. The Plan shall cover activities for the contract period and shall include:

1. An organization chart showing each element of the quality organization and its relation to the entire organization.
- 2...A. narrative description of the contractor's existing system for implementing quality provisions, including proposed changes to the existing system needed to meet cited provisions and the time schedule for implementing such changes. The plan should be arranged in the same sequence as the inspection system provisions appear in this publication or the plan should contain a cross-reference chart to applicable sections thereof.
3. Reference to contractor quality documents to be utilized in meeting inspection system provisions.
4. Charts indicating the flow of articles and materials from receiving through fabrication operations, test and/or delivery; and showing the location of inspection and test stations or points in relation to flow of articles and materials. Control documents, such as drawings, specifications and procedures, shall be referenced and associated with each inspection and test station or point.
5. Designation of suppliers or subcontracted hardware categories which in the contractor's judgement will require invoking these inspection system provisions and a statement of the extent to which cited provisions, or any others cited elsewhere in the contract, will be incorporated in subcontracts or purchase agreements.

1C202 DOCUMENT CONTROLS

1. **General.** Articles and materials shall be received, stored, processed, fabricated, inspected, and tested to applicable documents, including authorized changes thereto.
2. **Change Control.** A change control system shall be maintained, providing for document distribution to the proper points at the proper times and removal of obsolete documents from operating areas. The control system shall provide for initiation of document change requests. Changes that involve interface relationships or that affect articles and materials controlled by others shall be coordinated with the affected parties. These requirements shall be effectively integrated with other document control requirements of the contract.
3. **Change Effectivity.** The effectivity point (e.g., date, serial numbers, lot numbers) of documents and changes which affect article and material procurement, fabrication, inspection and test operations shall be clearly specified. Changes accomplished on the affected articles or materials shall be appropriately and clearly marked or identified; and associated documents shall be revised accordingly.

1C203 HANDLING, PACKAGING, PACKING AND STORAGE CONTROLS

Controls, including written procedures, shall be established by the contractor for the handling, packaging, packing, and storage of articles and materials. Specific procedures shall be provided for limited life articles and materials. These controls shall be specified on control documents, such as drawings, specifications and procedures, and shall be implemented throughout all contractor operations. Controls shall be established to prevent damage, deterioration, or improper substitution of articles or materials. Cleanliness levels for articles and materials shall be maintained as provided in the contract.

1C204 GOVERNMENT PROPERTY CONTROLS

1. **Contractor Responsibility.** The contractor shall be responsible for all Government property supplied by the Government in accordance with the provisions of the contract. Contractor responsibilities towards Government property shall include, but not be limited to, the following:
 - a. Examination upon receipt to detect damage in transit.
 - b. Inspection for quantity, completeness, proper type, size, and grade as specified in shipping documents.
 - c. Provision for the protection, maintenance, calibration, periodic inspection, segregation and controls necessary to prevent unauthorized use, damage, or deterioration during handling, storage, installation, or shipment.

d. Maintenance of records which include:

(1) Identification and location of the property.

(2) Dates, types, and results of contractor inspections, tests and other significant events.

e. To the extent required, perform functional testing to determine satisfactory operation prior to processing or installation.

2. ***Unsuitable Government Property.*** Any Government property found damaged, malfunctioning, or otherwise unsuitable for use shall be immediately identified, segregated, and reported in accordance with Government procedures. Government property shall not be dispositioned, repaired, reworked, replaced, or in any way modified unless authorized by the NASA Contracting Officer.

CHAPTER 3: DETAILED INSPECTION SYSTEM REQUIREMENTS

1C300 PROCUREMENT CONTROLS

1. The contractor is responsible for the adequacy and quality of all purchased articles and materials.
2. Articles and materials shall be inspected upon receipt. When it is not practical or feasible to determine quality conformance upon receipt, the contractor shall assign quality assurance personnel to perform inspections at supplier facilities. When so assigned, the contractor will provide a list of duties, responsibilities, and authorities of his assigned quality assurance personnel to the Government representative at the contractor's facility.

1C301 GOVERNMENT SOURCE INSPECTION

The need for Government source inspection will be determined by NASA or its Government representative. Source inspection performed by the Government on procured articles or materials shall not replace contractor inspection or relieve the contractor of his responsibility for ensuring the quality of procured articles and materials.

1C302 PROCUREMENT DOCUMENT CONTROLS

1. Procurement documents shall be controlled to ensure incorporation of applicable quality and technical requirements in accordance with subparagraphs 2 and 3.
2. **Technical Requirements.** Procurements shall incorporate or reference the appropriate technical requirements for articles, materials or services to be provided. Applicable revisions shall also be indicated and documents provided.
3. **Quality Requirements.** The following detailed quality requirements, as necessary, shall be included, or technical documents containing these requirements shall be referenced in subcontracts. Applicable revisions of referenced documents shall be indicated and documents provided as necessary.
 - a. **Changes.** Suppliers shall notify the contractor of any proposed changes in design, fabrication methods, or processes previously approved by the contractor and obtain written approval of the changes from the contractor. Changed articles shall be clearly identified and in a different manner from previous articles. When a proprietary item is procured by the contractor, the supplier shall be required to notify the contractor of changes.

b. ***Purchased Raw Materials.*** Purchased raw materials shall be accompanied with chemical and/or physical test results.

c. ***Raw Materials Used in Purchased Articles.*** Results of tests performed on specimens or detailed analyses of supplier's acceptance test results on all raw materials that are required to satisfy specification requirements and which are employed in the fabrication of articles purchased on a subcontract or purchase agreement shall be made available to the contractor upon request.

d. **Preservation, Packaging, Packing, and Shipping.** Requirements for preservation, packaging, packing and shipping of articles and materials shall be specified or referenced.

e. ***Age Control and Life Limited Products.*** Records for articles and materials having definite characteristics of quality degradation or drift with age and/or use shall indicate the date and test time or cycle at which useful life was initiated, the life or cycles used, and the date and test time or cycle at which useful life will be expended. When appropriate, specify that the articles and materials exhibit similar information. Suppliers shall ensure removal or rework of such articles and materials as required.

f. ***Identification and Data Retrieval.*** Identification and data retrieval requirements shall be specified.

g. ***Inspection and Test Characteristics.*** Characteristics to be subject to inspections or tests by the supplier shall be specified.

h. ***Inspection and Test Records.*** Inspection and test records to be maintained by the supplier shall be clearly specified. Records to be provided to the contractor or his quality assurance personnel shall be specified.

i. ***Resubmission of Nonconforming Articles or Materials.*** Nonconforming articles and materials returned by the contractor and subsequently resubmitted by the supplier shall bear adequate identification of such nonconformance, either on the articles, materials, or applicable supplier records. Reference shall be made to the contractor's nonconformance documents and evidence provided by the supplier that causes for nonconformances have been corrected and actions taken to preclude recurrence.

j. ***Contractor Quality Assurance Activity at Source.*** When contractor quality assurance activity is required at a supplier's facility, the procurement document shall so indicate.

k. **Government Source Inspection (GSI).** When the Government elects to perform inspection at a supplier's plant, the following statement shall be included in the procurement document:

"All work on this order is subject to inspection and test by the Government at any time and place. The Government quality representative who has been delegated NASA quality assurance functions on this procurement shall be notified immediately upon receipt of this order. The Government representative shall also be notified forty-eight (48) hours in advance of the time articles or materials are ready for inspection or test."

l. **Procurements Other Than Those Requiring GSI.** Procurements which do not require Government Source Inspection shall include the following Statement:

"The Government has the right to inspect any or all of the work included in this order at the supplier's plant."

m. **Records Retention.** Detailed requirements for retention of records shall be specified by the contractor.

1C303 RAW MATERIAL CONTROLS

Raw materials shall be inspected and tested (e.g., chemical and/or physical testing conducted) to determine conformance to applicable drawings and specifications; drawings and specifications shall include chemical and/or physical test criteria, as appropriate. Reports of actual test results shall be identified with the particular materials. Raw materials shall be segregated and controlled to prevent use of materials which do not conform to drawings and specifications or which are awaiting completion and receipt of satisfactory test results.

1C304 INSPECTION AND TEST CONTROLS

Procured and fabricated articles and materials shall be inspected and tested to ensure conformance to contract requirements, including applicable drawings, specifications and changes thereto. These inspections shall occur during receiving, processing, fabrication, assembly, and shipping phases. Written inspection and test procedures shall be prepared, supplementing contract requirements, to clarify details of the inspection and measuring equipment required, the detailed operations to be performed, the criteria for determining quality conformance or rejection of articles and materials and the results to be documented.

1C305 INSPECTION AND TEST RECORDS

Records of all inspection and tests performed shall be maintained. The records shall provide evidence that the required inspections and tests for individual articles and materials have been performed, including article or material identification, the inspection or test involved, the number of conforming articles or materials, the number of

nonconforming articles or materials, the nature of the nonconformances and the causes for the nonconformances. When required, actual inspection and test results shall be included.

1C306 INSPECTION STATUS CONTROLS

Controls shall be maintained for continuously indicating the inspection status of articles and materials by using identifications distinctly different from Government inspection identification. This shall be accomplished by means of stamps, seals, or decals on individual articles and materials; or tags, routing cards, move tickets or other normal control devices attached to the articles, materials or their containers. Application of stamps shall not damage the articles or materials or compromise their quality in any way. Stamping methods and materials shall be compatible with the articles and materials involved. Inspection status controls shall also provide traceability to the individual(s) who performs the inspection. Contractor stamps having the same shape as NASA stamps are permissible providing the contractor stamp does not include the designation "NASA".

1C307 PROCESS CONTROLS

Controls, including written procedures, shall be established over processes for which the uniform quality of articles or materials cannot be assured solely by inspections or tests. These processes include, for example, plating, anodizing, radiography, ultrasonics, magnetic particle and liquid penetrant inspection, heat treating, welding, and soldering. When approval or certification of processes, personnel, equipment, or procedures is required by contract, drawings or specifications, such approvals or certification of processes shall be obtained prior to processing articles and materials. Records shall be maintained of approvals and certifications of processes, personnel, equipment and procedures, and results of inspections associated with processes. These records shall be maintained to evidence continuous control over the processes involved.

1C308 WORKMANSHIP STANDARDS

When establishment of acceptance/rejection criteria requires the use of visual aids or physical samples of acceptable workmanship, these workmanship standards will be jointly selected by the contractor and the procuring NASA Installation, or its designated Government representative. Standards shall be maintained to meet current requirements.

1C309 NONCONFORMING ARTICLE AND MATERIAL CONTROLS

1. **General.** When an article or material does not conform to applicable drawings, specifications or other requirements, it shall be identified as nonconforming, segregated from work operations to the extent practicable, held for further action and the nonconformance documented.

2 ***Nonconformance Documentation***, Nonconformance documents shall include:

- a. A unique and traceable document number.
- b. The nomenclature and identification of the nonconforming article or material.
- c. A description of the nonconformance and its required drawing and/or specification characteristic or design criteria.
- d. Cause or reason for the nonconformance.
- e. Remedial action taken or recommended.
- f. Disposition of the nonconforming article or material.
- g. Initiator of the document.
- h. Signatures of authorized personnel.

3. ***Initial Review Dispositions***. Nonconforming articles or materials shall be reviewed initially by contractor quality assurance personnel and shall be subjected to one of the following dispositions:

- a. ***Return for Rework or Completion of Operations***. Nonconformances may be corrected by rework or completion of operations using the established drawings, specifications or procedures. Such articles or materials shall be resubmitted to normal inspection and/or test operations.
- b. ***Scrap***. Articles or materials obviously unfit for use shall be scrapped in accordance with Government approved contractor procedures for identifying, controlling and disposing of scrap.
- c. ***Repair***. Nonconformances that the contractor considers correctable by additional, documented repair procedures shall be referred to the procuring NASA Installation. Use of such articles or materials and their repair shall await instructions from NASA. Procedures shall include inspections and/or tests to verify acceptability of the repair.
- d. ***Use-As-Is***. Nonconformances that the contractor considers do not adversely affect safety, reliability, durability, performance, interchangeability, weight or basic objectives of the contract shall be referred to the procuring NASA installation. Use of such materials or articles shall await instructions from NASA.
- e. ***Material Review Board***. When authorized by the contract, the contractor may submit nonconformances in the "repair" and "use as is" categories to a Material Review Board for disposition. See paragraph 1C105 and Appendix C.

Initial review dispositions shall be recorded on nonconformance documents. Nonconforming articles or materials authorized to be repaired, or "used-as-is" shall be so identified in records for those articles or materials.

4. **Remedial and Preventive Action.** The contractor shall take remedial and preventive action on each nonconformance, including:

- a. Conducting analyses and examinations of nonconforming articles, materials, or conditions, to the extent necessary, to isolate and determine the cause(s) or reason(s) for the nonconformance.
- b. Conducting timely and effective remedial action to ensure the correction of the article, material or condition.
- c. Conducting timely and effective preventive action to prevent recurrence of the nonconformance. This includes correction of related drawings, specifications, or procedures. Correction of other identical articles or materials at all locations, and the prevention of detrimental side effects.
- d. Assigning responsibility for follow-up of remedial and preventive actions to ensure satisfactory accomplishment.
- e. Notifying responsible organizational elements of nonconformances and the need for remedial and preventive actions.
- f. Documenting analyses and remedial and preventive actions.
- g. Closing out nonconformance documentation after verifying that effective remedial and preventive actions have been taken.
- h. Notifying the procuring NASA. Installation of nonconformances and their related remedial and preventive actions, as established by contract.

Nonconforming articles and materials shall be forwarded to the procuring NASA Installation when requested by the Contracting Officer.

1C310 METROLOGY CONTROLS

1. **General.** A documented metrology system shall be established and utilized to control measurement processes in order to provide objective evidence of quality conformance. Measurement standards and equipment shall be selected and controlled to the degree necessary to meet contract requirements. Measurement processes shall be performed in accordance with established written procedures.

2. **Article or Material Measurement Processes.** Random and systematic errors in any article or material measurement process shall not exceed 10% of the tolerance of the article

or material characteristic being measured. Authorization for exception shall be requested from the procuring NASA Installation.

3. **Calibration Measurement Processes.** Random and systematic errors in any calibration measurement process shall not exceed 25% of the tolerance of the parameter being measured. Authorization for exception shall be requested from the procuring NASA Installation.

4. **Calibration Controls.**

a. **Facilities.** The contractor shall have his own or use the services of an outside facility for the calibration of measurement standards and equipment.

b. **Environments.** Environmental characteristics (e.g., temperature, humidity, vibration, and cleanliness) shall be compatible with the accuracy requirements of the article or material and the measurement processes.

c. **Traceability.** All measurement standards shall be traceable to standards maintained by the National Bureau of Standards or their value(s) shall be derived from a controlled measurement process utilizing a fundamental constant of nature.

d. **Handling, Storage, and Transportation.** All measurement standards and equipment shall be handled, stored and transported in a manner which shall not adversely affect quality nor result in hazardous conditions,

e. **Identification and Labeling.** All measurement standards and equipment shall be uniquely identified and labeled, tagged, or coded to indicate calibration status and due date of next calibration. In the event of limited calibration, the limits for accuracy and range shall be indicated.

f. **Calibration Intervals.** Calibration intervals shall be established and periodically reviewed to maximize the availability of measurement standards and equipment without adversely affecting quality. Intervals shall depend upon the use, accuracy, type of standard or equipment, required precision and other conditions adversely affecting quality.

g. **Recall System.** All standards and equipment used in measurement processes shall be recalled and recalibrated at established intervals. Standards and equipment not recalibrated before the recall due date shall be removed from service or otherwise restricted from use. Authorization for exception shall be obtained from NASA. Controls shall be established to ensure the immediate recalibration or removal from service of those found to exceed the established interval or which for any reason may have an adverse affect on quality.

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h. **Calibration Records.** The contractor shall maintain individual records of measurement standards and equipment. These records shall include, but not be limited to, the following:

- (1) Identification of the standard or equipment to be calibrated.
- (2) Identification of standard, equipment, and calibration procedure utilized in the calibration process.
- (3) Calibration intervals.
- (4) Dates and results of each calibration.
- (5) Due date of next calibration.
- (6) Individual(s) performing calibration.
- (7) Calibration facility.
- (8) Degree of nonconformance of standards or equipment received for calibration.

1C311 SAMPLING INSPECTION

Sampling inspection shall be performed only to the extent provided in the contract or with the prior approval of NASA

APPENDIX A: QUALITY DOCUMENTS CROSS-REFERENCE INDEX

1C201..... Inspection System Plan

1C203..... Handling, Packing, Packaging Procedures

IC204..... Government Property Records

IC302..... Procurement Documents

IC303..... Raw Material Test Reports

1C304..... Inspection and Test Procedures

1C305..... Inspection and Test Records

IC307..... Process Control Procedures

IC307..... Process Control Records

1C309-2..... Nonconformance Documentation

IC310-1..... Metrology System Procedures

IC311..... Sampling Plans

APPENDIX B: GLOSSARY OF TERMS

Analysis (Nonconformance): The study of a specific nonconformance in order to determine the causes and to arrive at a course of remedial and preventive action.

Article: A. unit of hardware or any portion thereof required by the contract.

Certification (Personnel): The act of verifying and documenting that personnel have completed required training and have demonstrated specified proficiency.

Certification (Process): A. written statement based on objective quality evidence that a process conforms to specified requirements.

Characteristic: Any dimensional, visual, functional, mechanical, electrical, chemical, physical or material feature or property of an article or material; and any control element which describes and establishes the design, fabricating and operating requirements of an article or material.

Conforming: A condition of an article, material, or service, which complies with specified requirements.

Contract: The prime contract executed by the Government and the prime contractor which, in addition to the terms and conditions thereof, includes by reference or otherwise, specifications, drawings, exhibits and other data necessary to its proper performance.

Contracting Officer: Any Government employee who is currently designated a Contracting Officer with the authority to enter into and administer contracts and make determinations and findings with respect thereto, or with any part of such authority. The term also includes the authorized representative of the Contracting Officer acting within the limits of his delegated authority.

Contractor: The individual(s) or concern(s) who enter into a prime contract with the Government.

Deliver: The physical transfer of possession. The contract specifies the point and time at which delivery takes place.

Designated Government Quality Representative: An individual designated by the procuring NASA. Installation to perform a-specific function(s) relative to a contractor's quality assurance effort.

Effectivity: The point at which an action occurs to produce a desired result.

Fabrication: The act of manufacturing or making; also the building assembly, or construction of articles and materials.

Government Property: All property owned by or leased to the Government or acquired by the Government under the terms of a contract. Government property includes both Government furnished property and contractor acquired property, the title to which is vested in the Government.

In-Process Inspection: Inspection that is performed during the fabrication cycle.

Inspection: The process of measuring, examining, gaging, or otherwise comparing an article, material or service with specified requirements.

Material: The substances of which an article is composed.

Measuring Equipment: Gages; inspection, measuring and test equipment; automated equipment; tools; jigs; fixtures; etc. which measure characteristics and parameters. Includes production tools incorporating an inspection, measuring or test function used for acceptance.

Measurement Processes: The application of standards, equipment, methods, environment and personnel to determine the magnitude of characteristics and parameters of articles and materials, equipment and standards.

Nonconformance: A condition of any article, material, or service in which one or more characteristics do not conform to requirements. Includes failures, discrepancies, deficiencies, defects and malfunctions.

Objective Quality Evidence: Any fact(s) pertaining to the quality of articles, materials or services based on observations, measurements or tests which can be fully verified.

Preventive Action: Action to preclude or minimize the occurrence or recurrence of a nonconformance.

Quality Assurance: A planned and systematic pattern of all actions necessary to provide adequate confidence that the end-item will meet all specified requirements.

Remedial Action: Action to correct a nonconforming article or material.

Repair: Operations performed on a nonconforming article or material to place it in a usable and acceptable condition; requires additional written procedures and additional operations.

Rework: The continuation of processing of articles and materials that will make them conform to drawings, specifications, procedures or contract. Requires only normal operations to complete the article or material in accordance with the applicable documents and does not require additional written procedures.

Source Inspection (Government or Contractor): Inspection at the plant of the actual supplier of articles, materials, or services.

Subcontract: A. contract or purchase order entered into under a Government prime contract by a supplier. May include orders issued to activities or subdivisions of the contractor.

Subcontractor: The individual(s) or concern(s) who enters into a subcontract or purchase agreement under a Government prime contract.

Supplier: A. subcontractor, at any tier, performing the services or producing The -contract articles for the contractor.

APPENDIX C: MATERIAL REVIEW BOARD (See Paragraph 1C105)

Membership: The MRB shall be comprised of one contractor representative whose primary responsibility is engineering, one contractor representative whose primary responsibility is quality, and the designated Government quality representative. Contractor members for the MRB shall be selected by the contractor on the basis of technical competence and shall have sufficient authority to make appropriate dispositions of the article or material involved. Contractor personnel designated for membership shall be subject to approval by the Government quality representative.

Responsibility: The MRB shall:

1. Determine disposition of submitted articles or materials designated as nonconforming.
2. Ensure that effective remedial and preventive actions are documented on the nonconformance document prior to disposition.
3. Provide recommendations to the NASA Contracting Officer concerning nonconformance dispositions requiring approval and verifying implementation after approval is obtained.
4. Ensure that accurate records of MRB actions are maintained.

MRB Dispositions: Dispositions require the unanimous agreement of the Board members. In determining dispositions, the Board shall: consider the effect of the nonconformance upon the intended use, review records of earlier review actions affecting the same article or material, and consider the recommendations of personnel acting in an advisory capacity. After the Board has determined that an initial review disposition to submit a nonconforming article or material to MRB is proper, the Board shall specify on the nonconformance document one of the following dispositions:

1. **Rework:** If the article or material is in the category of return for rework or completion of operations (paragraph IC309-3a), it shall be so dispositioned and shall be subject to normal operations including inspection and/or test.
2. **Repair:** When, in the opinion of the Board, an acceptable repair is possible, repair action may be authorized. Additional, documented procedures shall be established or approved by the MRB to perform this repair. Procedures shall include appropriate inspections and tests to verify the acceptability of the repair.
3. **Scrap:** If the article or material is unfit for use, it shall be dispositioned in accordance with Government approved contractor procedures for identifying, controlling, and disposing of scrap.

4. ***Use-as-is:*** Nonconformances which do not adversely affect safety, reliability, durability, performance, interchangeability, weight, or the basic objectives of the contract may be accepted for use-as-is. The rationale for making a use-as-is disposition shall be documented on the nonconformance report.

5. ***Written Request For Contracting Officer Approval:*** Nonconformances which do adversely affect safety, reliability, durability, performance, interchangeability, weight or the basic objectives of the contract shall be referred to the NASA Contracting Officer for approval, if the contractor wishes to offer such articles or materials for delivery.

6. ***Written Requests for NASA Contracting Officer Approval:*** Contractor written requests for NASA approval of nonconformances for which the contractor recommends a disposition to repair or use-as-is must be submitted to the NASA Contracting Officer for approval when the nonconformance adversely affects safety, reliability, durability, performance, interchangeability, weight, or the basic objectives of the contract. Each nonconformance request shall be submitted through the MRB with the Board's written recommendations and proposed remedial and preventive action. Such articles and materials shall be withheld from further processing until NASA Contracting Officer approval is obtained.

7. ***Supplier Material Review Board:*** The contractor may, with approval of NASA, delegate MRB responsibility to suppliers.