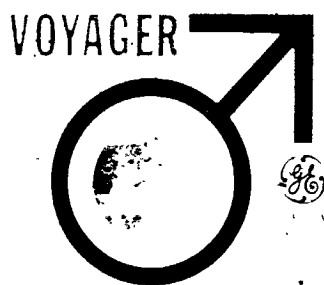
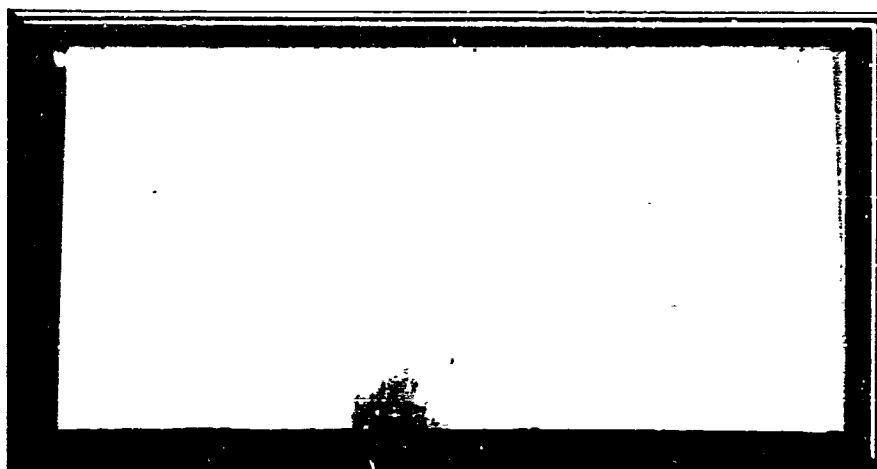


MISSILE AND SPACE DIVISION



PHASE IA, TASK C FINAL REPORT

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28 JULY 1967

VOLUME 5
DATA MANAGEMENT STUDY

APPENDIX B
CONTRACTOR DATA PACKAGE
PLANETARY QUARANTINE (PQ)

PREPARED BY

W.E. JOHNSTON
F.S. NAYOR

ENGINEERING MANAGEMENT
VOYAGER SPACECRAFT SYSTEM PROJECT

APPROVED BY



A. FRANK, COGNIZANT ENGINEER
DATA MANAGEMENT AND CONTROL TASK
VOYAGER SPACECRAFT SYSTEM PROJECT

PREPARED FOR

JET PROPULSION LABORATORY
CALIFORNIA INSTITUTE OF TECHNOLOGY
4800 OAK GROVE DRIVE
PASADENA, CALIFORNIA

UNDER JPL CONTRACT NO. 951112

GENERAL  ELECTRIC

MISSILE AND SPACE DIVISION
Valley Forge Space Technology Center
P. O. Box 8555 • Philadelphia, Penna. 19101

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INTRODUCTION

This appendix presents the Contractor Data Package (Data Item Matrix, Data Requirement Descriptions, User Flow Diagram, Document Relationship Tree, and Frequency and Phasing Charts) for Planetary Quarantine (PQ).

These data relate to microbiological factors; sterilization, contamination, and decontamination considerations; related assaying, assembly, and testing operations; and all other information of direct relevance to the planning, control, review, and reporting of the Voyager planetary quarantine program.

The complete list of Contractor Data Package appendixes is as follows:

- Appendix A - Technical Description and System Engineering (SE)
- Appendix B - Planetary Quarantine (PQ)
- Appendix C - Manufacturing (MG)
- Appendix D - Configuration Management (CM)
- Appendix E - Quality Assurance (QA)
- Appendix F - Test (TE) and Mission Operations (MP)
- Appendix G - Reliability Assurance (RA)
- Appendix H - Logistics and Support (LS)
- Appendix I - Overall Management (MA); Scheduling (SC); and Manning and Financial (MF)
- Appendix J - Procurement and Contracting (PC)
- Appendix K - Data Management (DM)
- Appendix L* - Facilities (FA)
- Appendix M* - Safety (SA)
- Appendix N* - Site Activation for Launch (AL)
- Appendix O* - Science (SI)
- Appendix P* - Related Project Interfaces (RP)
- Appendix Q* - Advanced Missions (AM)

*Appendixes L through Q prepared under Contract NAS7-584

| DATA ITEM NUMBER | DATA ITEM 1 of 2 <u>PLANETARY QUARANTINE</u> | DESCRIPTION |
|------------------|--|--|
| | <u>GUIDELINES</u> | |
| PQ-001 | Guidelines, System Operational Design for Planetary Quarantine | Establishes constraints on system operations |
| PQ-002 | Guidelines, Equipment Design for Planetary Quarantine | Provides parameters for acceptable methods hardware design. |
| | | |
| | <u>LISTS</u> | |
| PQ-003 | List, Sterilizable Parts, General Engineering | A list of materials and components which have sterilization. |
| | | |
| | <u>PLANS</u> | |
| PQ-004 | Plan, Planetary Quarantine, Spacecraft | Provides the detailed overall plan for meeting design and operation of the spacecraft. |
| PQ-005 | Plan, Planetary Quarantine, Planetary Vehicle Test | Provides a plan to maintain decontamination an acceptable value during combined spacecr |
| | | |
| | <u>PROCEDURES</u> | |
| PQ-006 | Procedure, Planetary Quarantine, Operating | Provides operating procedures, constraints, manufacturing, quality assurance and test pe quarantine. |
| PQ-007 | Procedure, Bio-Assay Test | Provides detailed procedures for conducting |

* KEY INFORMAL DATA

DATA ITEM LIST/USER MATRIX

| | APPLICABILITY TO FUNCTIONAL USERS AT CONTRACTOR LEVEL | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| | SE | PQ | MG | CM | QA | TE | RA | LS | MA | SC | PC | MF | MP | DM | FA | |
| l modes to meet PQ requirements. | R | R | U | - | U | R | R | U | PM | - | - | - | U | - | - | |
| and approaches for | R | A | U | - | U | - | R | - | R | - | - | - | - | - | - | |
| | | | | | | | | | | | | | | | | |
| ve been proven by test to withstand | R | A | U | U | U | - | R | U | U | - | - | - | - | - | - | |
| | | | | | | | | | | | | | | | | |
| g PQ constraints in the | R | R | U | - | U | R | U | U | PM | U | U | - | - | - | U | |
| and sterilization levels to aft and capsule test. | R | R | U | - | U | R | U | U | PM | U | U | - | - | - | U | |
| | | | | | | | | | | | | | | | | |
| and requirements for ersonnel to ensure maintenance of | U | R | R | U | R | U | U | U | PM | - | - | - | - | - | U | |
| bicassay tests. | U | A | - | - | - | U | U | U | - | - | - | - | - | - | - | |

U - USE R - REVIEW AUTHORITY A - APPROVAL AUTHORITY PM - PROJECT MANAGER APPROVAL

| SA | AL | SI | RP | AM | APPLICABILITY AT SUBCONTRACTOR/VENDOR/SUPPLIER LEVELS | | | | | APPLICABILITY TO PROJECT BOARDS | | | | | | | | | | | | | |
|----|----|----|----|----|---|-----------------------|------------------------|---------------|---------------|---------------------------------|-----------------------|--------------------------|-------------|---------------|----------------|-------------------|-----------------|-------------|-----------------|-------------------|------------------|---|---|
| | | | | | PRINCIPAL SUB-CONTRACTORS | MAJOR SUB-CONTRACTORS | KEY SUBCON AND VENDORS | OTHER VENDORS | KEY SUPPLIERS | KEY SUBSUPPLIERS | CONFIGURATION CONTROL | CONFIGURATION MANAGEMENT | DATA REVIEW | DESIGN REVIEW | FAILURE REVIEW | INTEGRATED SAFETY | INTEGRATED TEST | MAKE OR BUY | MATERIAL REVIEW | SOURCE EVALUATION | SOURCE SELECTION | | |
| - | U | U | - | U | NA | NA | NA | NA | NA | NA | - | - | - | - | - | - | - | - | - | - | - | - | - |
| - | - | U | - | U | (C/S) | (C/S) | (C) | NA | (C) | NA | - | - | - | - | - | - | - | - | - | - | - | - | - |
| - | U | U | - | U | (C/S) | (C/S) | (C) | NA | (C) | NA | - | - | - | - | - | - | U | - | - | - | - | - | - |
| U | U | - | - | U | NA | NA | NA | NA | NA | NA | - | - | - | - | - | - | U | - | - | - | - | - | - |
| U | U | - | - | U | NA | NA | NA | NA | NA | NA | - | - | - | - | - | - | U | - | - | - | - | - | - |
| U | U | - | - | U | (C/S) | (C/S) | (C) | NA | (C) | NA | - | - | - | - | - | - | U | - | - | - | - | - | - |
| U | U | - | - | - | (C/S) | (C/S) | (C) | NA | (C) | NA | - | - | - | - | - | - | U | - | - | - | - | - | - |

C - PREPARED BY CONTRACTOR

S - PREPARED BY SUBCONTRACTOR/VENDOR/SUPPLIER

() - OPTIONAL APPLICATION

NA - NOT APPLICABLE

| DATA ITEM NUMBER | DATA ITEM 2 of 2 <u>PLANETARY QUARANTINE</u> | DESCRIPTION |
|------------------|---|---|
| | <u>REPORTS</u> | |
| PQ-008 | Report, Bio-Assay Test | Provides the amount and extent of contamination of spacecraft hardware from bioassay test. |
| PQ-009 | Report, Planetary Quarantine Analysis | Provides mathematical probability analysis on the Mars contamination based on the spacecraft design. |
| PQ-010 | Report, Planetary Quarantine Audit | Provides a current accounting of the contamination of the spacecraft and a log of bioassay test results. |
| PQ-011 | Report, Planetary Quarantine, Planetary Vehicle (PV) Test | Provides the results of PV testing on the decontamination sterilization integrity of the planetary vehicle. |
| | | |
| | <u>SPECIFICATIONS</u> | |
| PQ-012 | Specification, Bio-Assay Test Requirements | Defines the requirements for biological assays (e. g. or components to assay, confidence levels, number |
| PQ-013 | Specification, Facilities Requirements, Planetary Quarantine Design | Specifies the clean room, clothing, and handling equipment requirements during all operations (manufacture, handling testing) where control of contamination is required. |
| PQ-014 | Specification, General Engineering, Planetary Quarantine Design | Specifies design constraints and requirements imposed by the Planetary Quarantine Plan. |
| | | |
| | | |
| | | |
| | | |

* KEY INFORMAL DATA

DATA ITEM LIST/USER MATRIX

| | APPLICABILITY TO FUNCTIONAL USERS AT CONTRACTOR LEVEL | | | | | | | | | | | | | | | |
|-----------------------------|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | SE | PQ | MG | CM | QA | TE | RA | LS | MA | SC | PC | MF | MP | DM | FA | SA |
| ilities and | U | A | - | - | U | U | U | - | - | - | - | - | - | - | U | - |
| tential of | R | A | - | - | U | U | U | - | - | - | - | - | - | - | - | - |
| ading on | U | R | U | - | U | U | U | - | PM | - | U | - | - | - | - | - |
| ation and | R | A | U | - | U | R | U | - | U | - | U | - | - | - | - | - |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| , what parts of assays). | R | A | U | U | U | U | R | U | - | - | - | - | - | - | - | U |
| ipment ndling, | - | A | U | U | U | U | U | - | - | - | - | - | - | - | U | U |
| ed by the | R | A | U | U | U | U | R | - | - | - | - | - | - | - | - | U |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

U - USE R - REVIEW AUTHORITY A - APPROVAL AUTHORITY PM - PROJECT MANAGER APPROVAL C

| | | | | APPLICABILITY AT SUBCONTRACTOR/VENDOR/SUPPLIER LEVELS | | | | | | APPLICABILITY TO PROJECT BOARDS | | | | | | | | | | |
|----|----|----|----|---|-----------------------|------------------------|---------------|---------------|------------------|---------------------------------|--------------------------|-------------|---------------|----------------|-------------------|-----------------|-------------|-----------------|-------------------|------------------|
| AL | SI | RP | AM | PRINCIPAL SUB-CONTRACTORS | MAJOR SUB-CONTRACTORS | KEY SUBCON AND VENDORS | OTHER VENDORS | KEY SUPPLIERS | KEY SUBSUPPLIERS | CONFIGURATION CONTROL | CONFIGURATION MANAGEMENT | DATA REVIEW | DESIGN REVIEW | FAILURE REVIEW | INTEGRATED SAFETY | INTEGRATED TEST | MAKE OR BUY | MATERIAL REVIEW | SOURCE EVALUATION | SOURCE SELECTION |
| U | - | - | - | (S) | (S) | (S) | NA | (S) | NA | - | - | - | - | - | - | U | - | - | - | - |
| - | - | - | - | NA | NA | NA | NA | NA | NA | - | - | - | - | - | - | - | - | - | - | - |
| U | - | - | - | (S) | (S) | (S) | NA | (S) | NA | - | - | - | - | - | - | U | - | - | - | - |
| U | U | U | - | NA | NA | NA | NA | NA | NA | - | - | - | - | - | - | U | - | - | - | - |
| U | - | - | - | (C) | (C) | (C) | NA | (C) | NA | U | U | - | - | - | - | U | - | - | - | - |
| U | - | - | - | (S) | (S) | (S) | (S) | (S) | NA | U | U | - | - | - | - | - | - | - | - | - |
| - | - | - | - | (S) | (S) | (S) | (S) | (S) | NA | U | U | - | - | - | - | - | - | - | - | - |

2-4-2

Planetary Quarantine (PQ) data Items have been included in the Engineering User Flow Diagrams. See Appendix A, Section 3.

Planetary Quarantine Data Requirement Descriptions

| <u>DRD Number</u> | <u>Title</u> |
|-------------------|---|
| PQ-001 | Guidelines, System Operational Design For Planetary Quarantine |
| PQ-002 | Guidelines, Equipment Design For Planetary Quarantine |
| PQ-003 | List, Sterilizable Parts, General Engineering |
| PQ-004 | Plan, Planetary Quarantine, Spacecraft |
| PQ-005 | Plan, Planetary Quarantine, Planetary Vehicle Test |
| PQ-006 | Procedure, Planetary Quarantine, Operating |
| PQ-007 | Procedure, Bio-Assay Test |
| PQ-008 | Report, Bio-Assay Test |
| PQ-009 | Report, Planetary Quarantine Analysis |
| PQ-010 | Report, Planetary Quarantine Audit |
| PQ-011 | Report, Planetary Quarantine, Planetary Vehicle (PV) Test |
| PQ-012 | Specification, Bio-Assay Test Requirements |
| PQ-013 | Specification, Facilities Requirements, Planetary Quarantine Design |
| PQ-014 | Specification, General Engineering, Planetary Quarantine Design |

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GE EXHIBIT DRD PQ-001

| | | | | | | | |
|--|-------------------|---|-------|--|------------------------|--|--------------------------|
| VOYAGER DATA REQUIREMENT DESCRIPTION | | | | DRD APPROVED BY | | DATE | DATA CATEGORY |
| ORGANIZATION ORIGINATING REQUIREMENT | CODE PQ | OFFICE RESPONSIBLE FOR DRD | CODE | DRD PREPARED BY F. S. Naylor | DATE 7/28/67 | CONTRACT NO | DRD NO. PQ-001 |
| TITLE OF DOCUMENT GUIDELINES, SYSTEM OPERATIONAL DESIGN FOR PLANETARY QUARANTINE | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION System Engineering | | TASK OR SUBTASK | DRL ITEM NO |
| | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION | | DRL NO | LEVEL NO |
| | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION | | DRL NO | FILE NO |
| TYPE OF DOCUMENT <input checked="" type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input type="checkbox"/> INFORMATION | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT STORAGE | | NO OF COPIES 30 | |
| USE OF DOCUMENT To provide background information and instructions to contractor system designers as to selection of operational modes and parameters that will meet the PQ constraints. | | | | ESTIMATED MANHOURS FOR SINGLE PREPARATION | | INFORMATION CUTOFF DATE OR MILESTONE | |
| | | | | ESTIMATED COST (\$) FOR SINGLE PREPARATION | | DATE DATA DUE TO USER | |
| INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS: PQ-004 Plan, Planetary Quarantine, Spacecraft SE-008 Specification, System Performance/Design Requirements | | | | FREQUENCY OF ISSUE <input type="checkbox"/> ANNUALLY <input type="checkbox"/> SEMI-ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> BI-MONTHLY <input type="checkbox"/> MONTHLY <input type="checkbox"/> SEMI-MONTHLY <input type="checkbox"/> BI-WEEKLY <input type="checkbox"/> WEEKLY <input type="checkbox"/> DAILY <input checked="" type="checkbox"/> OTHERWISE, AS SPECIFIED One time | | PUBLICATION DATE SDR | |
| | | | | | | UPDATE (FREQUENCY OR MILESTONE) As required through HDR | |
| CLASSIFICATION: <input type="checkbox"/> SECRET <input type="checkbox"/> CONFIDENTIAL <input type="checkbox"/> SECRET RESTRICTED DATA <input type="checkbox"/> CONFIDENTIAL RESTRICTED DATA <input checked="" type="checkbox"/> UNCLASSIFIED | | | | <input type="checkbox"/> GROUP 1 <input type="checkbox"/> GROUP 2 <input type="checkbox"/> GROUP 3 <input type="checkbox"/> GROUP 4 <input type="checkbox"/> PROPRIETARY <input type="checkbox"/> PUBLIC DOMAIN | | <input type="checkbox"/> SPECIAL HANDLING <input type="checkbox"/> NASA DISCREET <input type="checkbox"/> JPL DISCREET <input type="checkbox"/> PROJECT DISCREET <input type="checkbox"/> NOFORN | |
| FORM OF DATA: | | KIND OF DATA | | REFERENCE DOCUMENTS | | | |
| <input checked="" type="checkbox"/> PRINTED DOCUMENT <input type="checkbox"/> CHART <input type="checkbox"/> DIAGRAM <input type="checkbox"/> DRAWING <input type="checkbox"/> FILM (STATIC OR MOTION) <input type="checkbox"/> ILLUSTRATION <input type="checkbox"/> MODEL <input type="checkbox"/> RECORDING (TAPE OR DISC) <input type="checkbox"/> COMPUTER CARD <input type="checkbox"/> COMPUTER TAPE <input type="checkbox"/> MICROFILM (W/OR W/O CARD) <input type="checkbox"/> OTHER | | <input type="checkbox"/> ABSTRACT <input type="checkbox"/> BROCHURE <input type="checkbox"/> BULLETIN <input type="checkbox"/> CATALOG <input type="checkbox"/> CONTRACT <input type="checkbox"/> DIRECTIVE <input type="checkbox"/> DISCLOSURE <input type="checkbox"/> ENGINEERING CHANGE ORDER <input type="checkbox"/> REQUEST FOR ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> HANDBOOK <input type="checkbox"/> INDEX | | | | | |
| APPLICABLE STANDARDS | | | | | | | |
| REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL) | | | | | | | |
| | | DRAFT | DATE | PREPUBLICATION PROOF | DATE | | |
| SUBMIT FOR REVIEW TO | | _____ | _____ | _____ | _____ | | |
| | | _____ | _____ | _____ | _____ | | |
| | | _____ | _____ | _____ | _____ | | |
| | | _____ | _____ | _____ | _____ | | |
| SUBMIT FOR APPROVAL TO | | Project Manager | _____ | _____ | _____ | | |
| | | _____ | _____ | _____ | _____ | | |

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS:

DRD NO.:

PQ-001

SPECIAL DISTRIBUTION. (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

This data item shall establish system operational design constraints such as the following:

1. Restrictions on Attitude Control System operational modes.
2. Restrictions on biobarrier separation techniques and sequencing.
3. Restrictions on mechanical operations inducing vibration.

The contents will consist of:

1. Scope
2. Planetary quarantine constraints - overall
3. Planetary quarantine constraints during operational phases
 - a. Prelaunch
 - b. Launch
 - c. Near-Earth corrections
 - d. Interplanetary cruise
 - e. Near-Mars corrections/orbit insertion
 - f. Martian orbit maneuvers
4. Recommended modes of operation for maintenance of quarantine.
 - a. Information for each phase

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD PQ-002

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS

DRD NO.:
PQ-002

SPECIAL DISTRIBUTION (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS

1. Scope
2. Planetary quarantine constraints
3. Methods of fulfilling planetary constraints
 - a. General approvals
 - b. Mathematical model
 - c. Audit and analysis
4. Requirements (general)
5. Recommended approaches
 - a. Design
 - b. Material selection
 - c. Bioassay
 - d. Manufacturing
 - e. Shipping
 - f. Field operation
 - g. Quality assurance
6. Notes

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD PQ-003

| | | | | | | | |
|--|-------------------|--|-------|--|------------------------|--|--------------------------|
| VOYAGER DATA REQUIREMENT DESCRIPTION | | | | DRD APPROVED BY | | DATE | DATA CATEGORY |
| ORGANIZATION ORIGINATING REQUIREMENT | CODE PQ | OFFICE RESPONSIBLE FOR DRD | CODE | DRD PREPARED BY F. S. Naylor | DATE 7/28/67 | CONTRACT NO. | DRD NO. PQ-003 |
| TITLE OF DOCUMENT LIST, STERILIZABLE PARTS, GENERAL ENGINEERING | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION System Engineering | | TASK OR SUBTASK | DRL ITEM NO. |
| | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION | | DRL NO. | LEVEL NO. |
| | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION | | DDL NO. | FILE NO. |
| TYPE OF DOCUMENT <input type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input checked="" type="checkbox"/> REFERENCE <input type="checkbox"/> INFORMATION | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT STOWAGE | | NO OF COPIES 25 | |
| USE OF DOCUMENT Provides a listing of materials, components, and parts which may be subjected to the approved sterilization cycles without degradation. | | | | ESTIMATED MANHOURS FOR SINGLE PREPARATION | | INFORMATION CUTOFF DATE OR MILESTONE | |
| | | | | ESTIMATED COST (\$) FOR SINGLE PREPARATION | | DATE DATA DUE TO USER | |
| INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS. PQ-002 Guidelines, Equipment Design for Planetary Quarantine SE-008 Specification, System Performance/Design Requirements | | | | FREQUENCY OF ISSUE | | PUBLICATION DATE SDR | |
| | | | | <input type="checkbox"/> ANNUALLY <input type="checkbox"/> SEMI-ANNUALLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> BI-MONTHLY <input type="checkbox"/> MONTHLY <input type="checkbox"/> SEMI-MONTHLY <input type="checkbox"/> BI-WEEKLY <input type="checkbox"/> WEEKLY <input type="checkbox"/> DAILY <input checked="" type="checkbox"/> OTHERWISE, AS SPECIFIED <p align="center">One time</p> | | UPDATE (FREQUENCY OR MILESTONE) Maintain current | |
| | | | | | | ESTIMATED EXPIRATION DATE | |
| CLASSIFICATION | | | | SPECIAL HANDLING | | ESTIMATED EXPIRATION DATE | |
| <input type="checkbox"/> SECRET <input type="checkbox"/> CONFIDENTIAL <input type="checkbox"/> SECRET RESTRICTED DATA <input type="checkbox"/> CONFIDENTIAL RESTRICTED DATA <input checked="" type="checkbox"/> UNCLASSIFIED | | <input type="checkbox"/> GROUP 1 <input type="checkbox"/> GROUP 2 <input type="checkbox"/> GROUP 3 <input type="checkbox"/> GROUP 4 <input type="checkbox"/> PROPRIETARY <input type="checkbox"/> PUBLIC DOMAIN | | <input type="checkbox"/> NASA DISCREET <input type="checkbox"/> JPL DISCREET <input type="checkbox"/> PROJECT DISCREET <input type="checkbox"/> NOFORN | | One time | |
| FORM OF DATA: | | | | REFERENCE DOCUMENTS | | | |
| KIND OF DATA <input checked="" type="checkbox"/> PRINTED DOCUMENT <input type="checkbox"/> ABSTRACT <input type="checkbox"/> INSTRUCTION <input type="checkbox"/> CHART <input type="checkbox"/> BROCHURE <input type="checkbox"/> LETTER <input type="checkbox"/> DIAGRAM <input type="checkbox"/> BULLETIN <input checked="" type="checkbox"/> LIST <input type="checkbox"/> DRAWING <input type="checkbox"/> CATALOG <input type="checkbox"/> LOG <input type="checkbox"/> FILM (STATIC OR MOTION) <input type="checkbox"/> CONTRACT <input type="checkbox"/> MANUAL <input type="checkbox"/> ILLUSTRATION <input type="checkbox"/> DIRECTIVE <input type="checkbox"/> MEMORANDUM <input type="checkbox"/> MODEL <input type="checkbox"/> DISCLOSURE <input type="checkbox"/> MINUTES <input type="checkbox"/> RECORDING (TAPE OR DISC) <input type="checkbox"/> ENGINEERING CHANGE ORDER <input type="checkbox"/> PLAN <input type="checkbox"/> COMPUTER CARD <input type="checkbox"/> REQUEST FOR ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> PROCEDURE <input type="checkbox"/> COMPUTER TAPE <input type="checkbox"/> ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> REGULATION <input type="checkbox"/> MICROFILM (W/OR W/O CARD) <input type="checkbox"/> ENGINEERING CHANGE PROPOSAL <input type="checkbox"/> REPORT <input type="checkbox"/> OTHER <input type="checkbox"/> HANDBOOK <input type="checkbox"/> SCHEDULE <input type="checkbox"/> INDEX <input type="checkbox"/> SPECIFICATION <input type="checkbox"/> STANDARD <input type="checkbox"/> VOUCHER | | | | NASA Sterilization Specifications. | | | |
| | | | | APPLICABLE STANDARDS | | | |
| REVIEWS AND/OR APPROVALS REQUIRED (LIST IN ORDER OF SUBMITTAL) | | | | | | | |
| SUBMIT FOR REVIEW TO | | DRAFT | DATE | PREPUBLICATION PROOF | DATE | | |
| _____ | | | _____ | _____ | _____ | | |
| _____ | | | _____ | _____ | _____ | | |
| _____ | | BY | _____ | _____ | _____ | BY | _____ |
| _____ | | | _____ | _____ | _____ | | |
| _____ | | | _____ | _____ | _____ | | |
| SUBMIT FOR APPROVAL TO | | | _____ | _____ | _____ | | |
| Manager. | | | _____ | _____ | _____ | | |
| System Engineering | | BY | _____ | _____ | _____ | BY | _____ |

GE EXHIBIT DRD PQ-003

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS

DRD NO.:
PQ-003

Data for this data item may be obtained from government and industrial facilities where extensive sterilization work has been performed. Additional experimentation will be required to provide information on materials not previously subjected to sterilization.

SPECIAL DISTRIBUTION. (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Scope
2. References
 - a. NASA sterilization specifications
 - b. Material compatibility studies
3. List of sterilizable parts
 - a. Sterilizable components and parts list
(valves, regulators, explosives, seals, etc.)
 - (1) Dry heat compatible
 - (2) Steam compatible
 - (3) Chemical sterilant compatible
 - b. Sterilizable materials list
 - (1) Dry heat compatible
 - (2) Steam compatible
 - (3) Chemical sterilant compatible
4. Data sources

GE EXHIBIT DRD PQ-004

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS

DRD NO.:
PQ-004

SPECIAL DISTRIBUTION. (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS.

1. Scope
2. Objectives of plan
3. Planetary quarantine constraints - spacecraft.
4. Planetary quarantine functional organization
 - a. Organizational responsibilities
 - b. Support organizations
5. Integrated planetary quarantine plan - spacecraft
 - a. Mathematical model/probability analysis
 - (1) Format
 - (2) Computer program
 - b. Material Selection criteria/controls
 - c. Test, Manufacturing and quality control criteris
 - (1) Handling
 - (2) Shipping
 - (3) Inspection
 - (4) Disassembly/repair
 - d. Sterilization/decontamination requirements
 - e. Clean room requirements

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD PQ-004

- f. Bioassay requirements
- g. Maintenance of decontamination integrity
 - (1) Post-decontamination Repair/Replacement
- 6. Planetary quarantine validation
 - a. Documentation
 - (1) Material selection reports
 - (2) Manufacturing operations reports
 - (3) Test operations reports
 - (4) Bioassay reports
 - b. Proof - Constraints met/maintained
 - (1) Planetary quarantine audits
 - (2) Planetary quarantine analysis
 - c. Approval cycles
- 7. Planetary quarantine schedule of events
- 8. References

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VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS

DRD NO.
PQ-005

SPECIAL DISTRIBUTION (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Scope
2. Objectives
 - a. Condition of capsule
 - b. Condition of spacecraft
3. Plan
 - a. Receiving inspection (bioassay)
 - b. Transportation and handling
 - c. Assembly precautions
 - d. Instrumentation limitations
 - e. Test restrictions
 - (1) Extent of operation
 - (2) Extent of disassembly
 - f. Aseptic Repair Requirements
4. Test flow diagrams - detaining points of bioassay, disassembly, and potential quarantine compromise.
5. Organizational responsibility

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

CE EXHIBIT DRD PQ-006

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS

DRD NO.:
PQ-006

SPECIAL DISTRIBUTION (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Scope
2. Planetary quarantine constraints
3. Planetary quarantine operating procedures
 - a. Manufacturing
 - (1) Cleaning
 - (2) Handling
 - (3) Assembly
 - (4) Shipping
 - b. Test
 - (1) Handling
 - (2) Repair/replacement
 - (3) Shipping
 - c. Quality Assurance
 - (1) Inspection
4. References

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD PQ-007

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS

DRD NO.:
PQ-007

Bioassay techniques to be employed shall be in accordance with those techniques set forth in the NASA "Standard Procedures for the Microbiological Examination of Space Hardware," by L. B. Hall and O. E. Reynolds, 1966.

SPECIAL DISTRIBUTION: (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Scope
2. Reference Documents (Specs, NASA Procedures, etc.)
3. Bioassay Procedure
 - a. Facility Monitoring (air flow, filtration system, and clean room surfaces)
 - (1) Preparation for assay
 - (2) Step-by-step assay procedure
 - (3) Data recording forms
 - (4) Approval sheets
 - b. Hardware monitoring
 - Components
 - Subsystems
 - Systems
 - (1) Preparation for assay
 - (2) Step-by-step assay procedure
 - (3) Data recording forms
 - (4) Approval sheets
4. Quality assurance provisions
5. Appendixes

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD PQ-008

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| VOYAGER DATA REQUIREMENT DESCRIPTION | | | | DRD APPROVED BY | | DATE | DATA CATEGORY |
| ORGANIZATION ORIGINATING REQUIREMENT | CODE | OFFICE RESPONSIBLE FOR DRD | CODE | DRD PREPARED BY | DATE | CONTRACT NO | DRD NO. |
| | PQ | | | H. G. Lorsch | 7/28/67 | | PQ-008 |
| TITLE OF DOCUMENT REPORT, BIOASSAY TEST | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION System Engineering | | TASK OR SUBTASK | DRL ITEM NO |
| | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION | | DRL NO. | LEVEL NO |
| | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION | | DDL NO. | FILE NO |
| TYPE OF DOCUMENT <input type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input checked="" type="checkbox"/> INFORMATION | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT STORAGE | | NO OF COPIES 50 | |
| USE OF DOCUMENT Document the degree of biological contamination of facilities and spacecraft hardware as ascertained by contractor tests. | | | | ESTIMATED MAN HOURS FOR SINGLE PREPARATION | | INFORMATION CUTOFF DATE OR MILESTONE | |
| | | | | ESTIMATED COST (\$) FOR SINGLE PREPARATION | | DATE DATA DUE TO USER | |
| INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS: PQ-004 Plan, Planetary Quarantine, Spacecraft PQ-007 Procedure, Bioassay Test PQ-012 Specification, Bioassay Test Requirements | | | | FREQUENCY OF ISSUE | | PUBLICATION DATE | |
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| | | Manager, | _____ | _____ | _____ | | |
| | | System Engineering | _____ | _____ | _____ | | |

GE EXHIBIT DRD PQ-008

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS:

DRD NO.:
PQ-008

A test report is to submitted for each bioassay test. Summary reports are to be submitted at the conclusion of each test phase.

SPECIAL DISTRIBUTION. (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS.

1. Summary
 - a. Test performed
 - b. Results
 - c. Conclusion
2. Applicable documents
3. Tests performed
 - a. Test description
 - b. Procedures and methods
 - c. Results
4. Conclusion and recommendation

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD PQ-009

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS

DRD NO.:

PQ-009

Data for the continual update of this report will be supplied, in part, by the Planetary Quarantine Audit Report.

SPECIAL DISTRIBUTION. (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Summary
2. Mathematical techniques employed
3. Status of design
4. Probability analysis
 - a. By subsystem/system contamination sources
 - b. By mission phases
 - c. By major events/catastraophies
5. Recommendations
6. Appendixes

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD PQ-010

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS

DRD NO.:

PQ-010

SPECIAL DISTRIBUTION (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Summary
 - a. Significant changes from previous report
 - b. Major problem areas
 - c. Anticipated significant events
2. Activities during reporting period
 - a. Assays conducted
(at what stage of fabrication/assembly)
3. Detailed Audit
 - a. Major Systems
 - b. Subsystems
 - c. Components
4. Action items for next quarter
5. References
 - a. Bioassay test reports

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD PQ-011

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS

DRD NO.:
PQ-011

SPECIAL DISTRIBUTION. (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS:

1. Scope
2. References
 - a. Planetary Quarantine Plan, Planetary Vehicle Test
 - b. Planetary Vehicle Test Report
3. Discussion
 - a. Activities affecting cleanliness integrity
 - b. Precautions taken/adequacy of precautions
 - c. Integrity compromised
 - (1) During preparation/handling
 - (2) During test
 - (3) During post-test repair/replacement
 - d. Effects of compromise
 - e. Recommended corrective action
4. Quality assurance report section
5. Appendixes

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD PQ-012

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS

DRD NO.:
PQ-012

None

SPECIAL DISTRIBUTION: (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

None

OUTLINE OF CONTENTS.

1. Scope
2. Applicable documents
3. Requirements
 - a. Facility certification
 - (1) Bioassay of air; methods, limits, procedures of permissible contamination
 - (2) Bioassay of filter banks; methods, procedures, limits of permissible contamination
 - (3) Bioassay of clean room surfaces; methods, procedures, limits of permissible contamination
 - b. Facility Monitoring
 - (1) Bioassay of air; methods, procedures, frequency, limits
 - (2) Bioassay of clean room surfaces; methods, procedures, frequency, limits
 - (3) Bioassay of tools, clothing, and personnel; methods, procedures frequency, limits

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD PQ-012

- c. Hardware monitoring
 - (1) Methods, procedures, frequency, interpretation
 - (2) Subassembly monitoring
 - (3) Assembly monitoring
 - (4) Monitoring during test, transportation, and prelaunch
- 4. Test and verification (quality assurance provisions)
- 5. Preparation for delivery (not applicable)
- 6. Notes
- 7. Appendixes

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GE EXHIBIT DRD PQ-013

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS

DRD NO.:

PQ-013

SPECIAL DISTRIBUTION. (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS.

1. Scope
2. Applicable documents
3. Requirements
 - a. Manufacturing facilities
 - (1) Clean room
 - Air flow rates
 - Particles/ft³ (allowable)
 - (2) Special facilities
 - Class x x x rooms
 - Bioclean areas
 - Class xxx clean benches
 - (3) Clothing for clean room operation
 - Entry conditions
 - Work clothes
 - Exit conditions
 - (4) Personnel hygiene
 - Baths, showers, etc.
 - Eating
 - Illness

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

GE EXHIBIT DRD PQ-013

- b. Handling - packing materials, packing techniques, etc.
 - (1) Components
 - (2) Assemblies
 - (3) System
- 4. Test and verification
- 5. Preparation for delivery (not applicable)
- 6. Notes
- 7. Appendixes

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GE EXHIBIT DRD PQ-014

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|---|------------|----------------------------|------|--|-----------------|--|------------------|
| VOYAGER DATA REQUIREMENT DESCRIPTION | | | | DRD APPROVED BY | | DATE | DATA CATEGORY |
| ORGANIZATION ORIGINATING REQUIREMENT | CODE PQ | OFFICE RESPONSIBLE FOR DRD | CODE | DRD PREPARED BY H. G. Lorsch | DATE 7/28/67 | CONTRACT NO | DRD NO PQ-014 |
| TITLE OF DOCUMENT SPECIFICATION, GENERAL ENGINEERING PLANETARY QUARANTINE DESIGN | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT PREPARATION System Engineering | | TASK OR SUBTASK | DRL ITEM NO |
| | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT REPRODUCTION | | DRL NO | LEVEL NO |
| | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT DISTRIBUTION | | DDL P.C | FILE NO |
| TYPE OF DOCUMENT. <input checked="" type="checkbox"/> CONTROL <input type="checkbox"/> ACTION <input type="checkbox"/> REFERENCE <input type="checkbox"/> INFORMATION | | | | USE OF DOCUMENT To provide overall requirement on the system design to insure fulfilling the planetary quarantine constraint. | | | |
| INTERRELATIONSHIP WITH OTHER DATA REQUIREMENTS. PQ-004 Plan, Planetary Quarantine, Spacecraft PQ-014 Specification, Bioassay Test Requirement SE-008 Specification, System Performance/Design Requirements SE-023 General Engineering Specification, Cleanliness | | | | ORGANIZATION RESPONSIBLE FOR DOCUMENT STORAGE | | NO OF COPIES 30 | |
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| REVIEWS AND/OR APPROVALS REQUIRED: (LIST IN ORDER OF SUBMITTAL) | | | | REFERENCE DOCUMENTS | | | |
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| BY | | | | BY | | | |
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| Manager, System Engineering | | | | BY | | | |

GE EXHIBIT DRD PQ-014

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET

SPECIAL INSTRUCTIONS

DRD NO.
PQ-014

SPECIAL DISTRIBUTION (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)

OUTLINE OF CONTENTS

1. Scope
2. Applicable documents
3. Requirements
 - a. Planetary quarantine constraints
 - (1) Probability of contamination
 - (2) Allocation of probability of contamination
 - b. Cleanliness
 - (1) Permissible load prior to contamination
 - (2) Permissible load after contamination
 - c. Decontamination - flow chart specifying type of decontamination to be employed at each assembly stage
4. Test and verification (not applicable)
5. Preparation for shipment (not applicable)
6. Notes
7. Appendixes

(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)

DOCUMENTATION RELATIONSHIP TREES

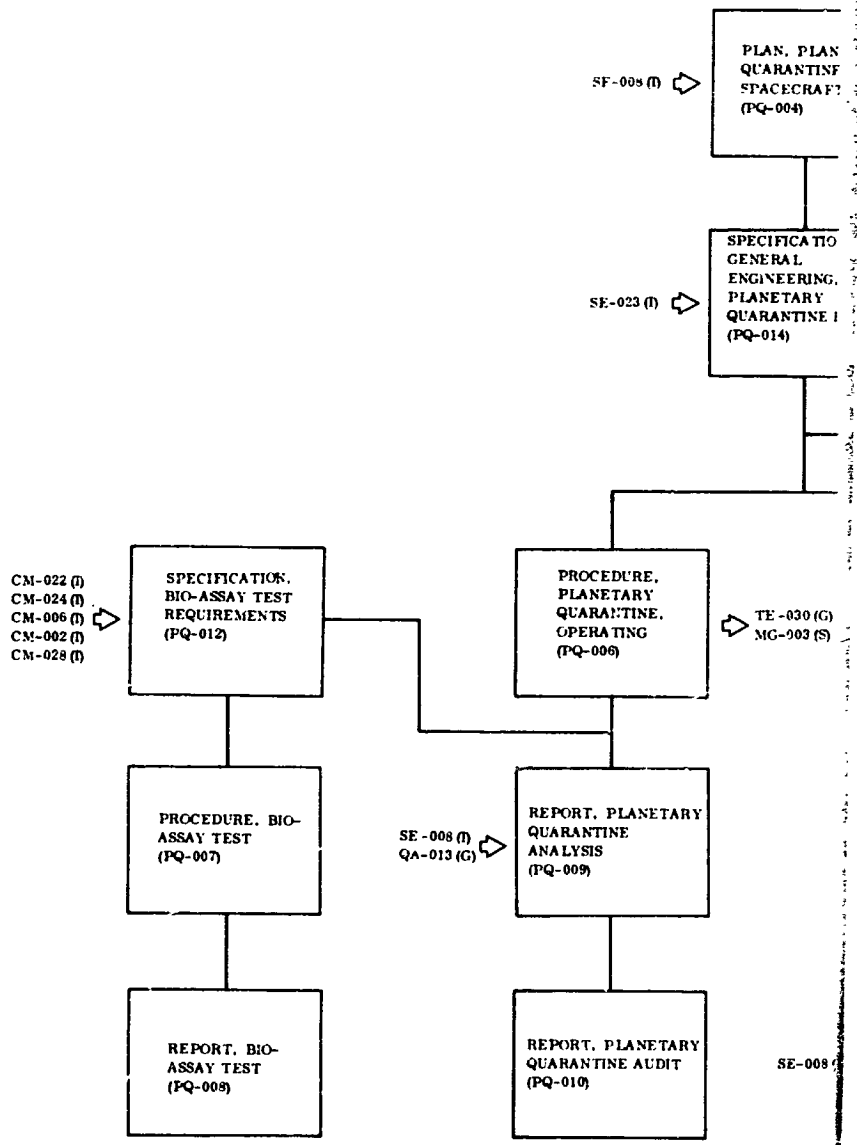
A documentation relationship tree has been prepared to show the relationship of data items within this functional category as well as their relationships across categories.

Relationships within each functional category are shown by constructing a tier pattern beginning with the top-level (or governing) data item and relating in descending order all data items within the category to this top-level data item. (The location of a data item at a given level on the diagram does not necessarily indicate the importance of that specific item but identifies and defines its relation to all other data items in that category.)

Relationships between data items in one category and data items in other functional categories are shown by (1) shaded arrows to indicate the direction of the relationship and (2) an alphabetic code to indicate the nature of the interrelationship as follows:

- a. Data items needed for preparation and/or support of the referenced item. (I)
- b. Data items that are supported or needed by this data item. (S)
- c. Data items that relate "to" and provide information of a general nature but are not required in an input or support role. (G)

Each data item appearing on the Data Item List (DIL) was examined and evaluated with respect to its contribution to, or dependence upon, data items appearing in other categories and is included in the diagrams. Additionally, certain data elements indicated in the user flow diagrams (but currently not identified as individual data items) have been shown within a dashed rectangle to clarify relationships.



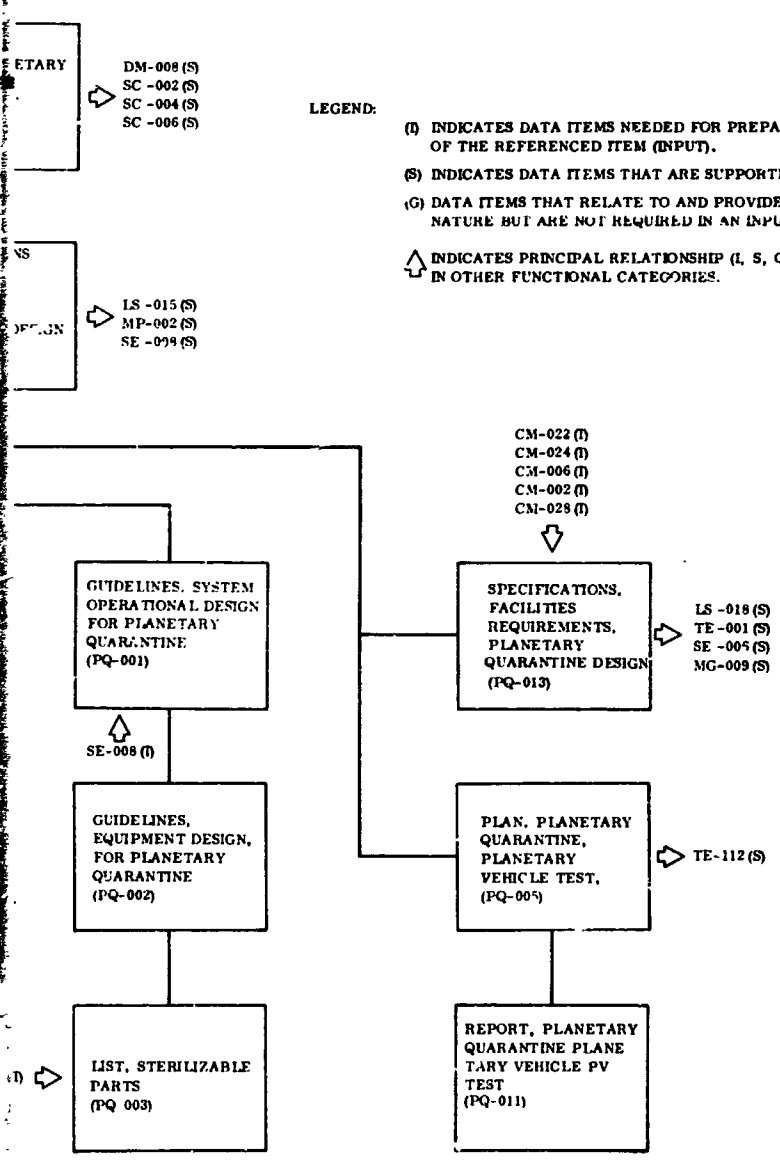


Figure B-1. Planetary Quarantine Documentation Relationship Tree (PQ)

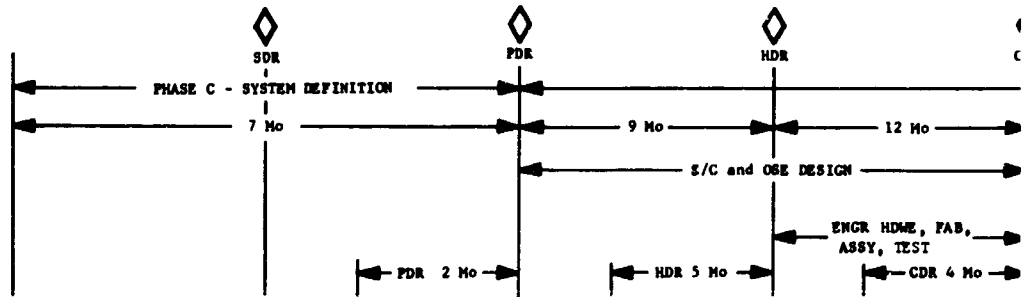
DATA ITEM PHASING/FREQUENCY

Data item frequency and phasing requirements for Planetary Quarantine are as shown in Figure B-2, Planetary Quarantine Data Item Phasing and Frequency Matrix.

Distribution and density of data item preparation requirements are shown in Figure B-3, Planetary Quarantine Data Item Density Profile.

PLANETARY QUARANTINE (PQ)

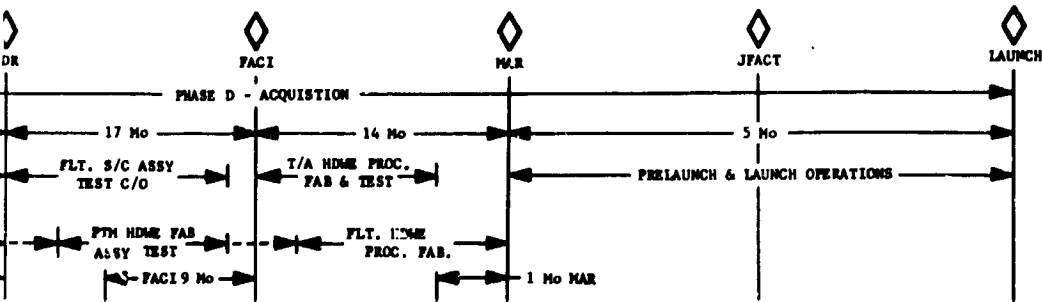
DATA ITEM TITLE



| DATA ITEM TITLE | QUANTITY | FREQUENCY | TOTAL | QUANTITY | FREQUENCY | TOTAL | QUANTITY | FREQUENCY | TOTAL | QUANTITY | FREQUENCY | TOTAL |
|--|----------|-----------|-------|----------|-----------|-------|----------|-----------|-------|----------|-----------|-------|
| GUIDELINES | | | | | | | | | | | | |
| FQ-001 Guidelines, System Operational Design for Planetary Quarantine | 1 | I | 1 | 1 | U | 1 | 1 | F | 1 | | | |
| FQ-002 Guidelines, Equip. Design for Plan. Quar. | 1 | I | 1 | 1 | U | 1 | 1 | F | 1 | | | |
| LISTS | | | | | | | | | | | | |
| FQ-003 List, Sterilizable Parts, Gen. Engrg. | | | | 1 | I | 1 | 1 | U | 1 | 1 | 2/U | 3 |
| PLANS | | | | | | | | | | | | |
| FQ-004 Plan, Planetary Quarantine, Spacecraft | 1 | I | 1 | 1 | U | 1 | | | | | | |
| FQ-005 Plan, Planet. Quar., Plan. Vehicle Test | | | | | | | 1 | I | 1 | 1 | 2/U | 3 |
| PROCEDURES | | | | | | | | | | | | |
| FQ-006 Procedure, Planetary Quar. Operating | 1 | I | 1 | 1 | U | 1 | 1 | U | 1 | | | |
| FQ-007 Procedure, Bio-Assay Test | | | | | | | 1 | I | 1 | 1 | 3/U | 4 |
| REPORTS | | | | | | | | | | | | |
| FQ-008 Report, Bio-Assay Test | | | | | | | | | | 100 | A/R | 100 |
| FQ-009 Report, Planetary Quarantine Analysis | | | | 1 | I | 1 | 1 | 2/U | 3 | 1 | 3/U | 4 |
| FQ-010 Report, Plan. Quar. Audit | | | | | | | | | | 1 | Q | 4 |
| FQ-011 Report, Planetary Quarantine, Planetary Vehicle (PV) Test | | | | | | | | | | | | |
| SPECIFICATIONS | | | | | | | | | | | | |
| FQ-012 Specification, Bio-Assay Test Requirements | | | | 1 | I | 1 | 1 | 2/U | 3 | | | |
| FQ-013 Specification, Facilities Requirements, Planetary Quarantine Design | 1 | I | 1 | 1 | U | 1 | | | | | | |
| FQ-014 Specification, General Engineering, Planetary Quarantine, Planetary | 1 | I | 1 | 1 | U | 1 | | | | | | |
| TOTALS | | | 8 | | | 9 | | | 12 | | | 118 |

*Key Informal Data

| | | | | | | | |
|-----|-------------|-----|-------------|-----|---------------------------|--------|-------------------|
| A | Annual | O/T | One Time | I | Initial | CDR | Critical Design R |
| S/A | Semi-Annual | A/R | As Required | F | Final | FACI | First Article Cor |
| WK | Weekly | U | Update | N/R | New and Revised | MAR | Mission Acceptar |
| MO | Monthly | I/U | One Update | SDR | System Design Review | J FACT | Joint Flight Acee |
| B/W | Bi-Weekly | DA | Daily | PDR | Preliminary Design Review | | Composite Test |
| B/M | Bi-Monthly | Q | Quarterly | HDR | Hard Design Review | | |



| QUANTITY | FREQUENCY | TOTAL | QUANTITY | FREQUENCY | TOTAL | QUANTITY | FREQUENCY | TOTAL | QUANTITY | FREQUENCY | TOTAL | TOTALS | NOTES AND ASSUMPTIONS |
|----------|-----------|-------|----------|-----------|-------|----------|-----------|-------|----------|-----------|-------|--------|-----------------------|
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| 1 | U | 1 | | | | | | | | | | 5 | |
| | | | | | | | | | | | | 3 | |
| 1 | U | 1 | | | | | | | | | | 6 | |
| | | | | | | | | | | | | | |
| 30 | A/R | 30 | 30 | A/R | 30 | 10 | A/R | 10 | | | | 170 | |
| 1 | 4U | 5 | 1 | 2/U | 3 | 1 | U | 1 | 1 | U | 1 | 18 | |
| 1 | Q | 6 | 1 | Q | 5 | 1 | Q | 2 | | | | 17 | |
| 1 | A/R | 1 | 1 | A/R | 1 | | | | | | | 2 | |
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| | | | | | | | | | | | | 2 | |
| | | | | | | | | | | | | 2 | |
| | | 45 | | | 39 | | | 13 | | | 1 | 243 | |

review
 Configuration Inspection
 Process Review
 Distance
 ing

Figure B-2. Planetary Quarantine Data Item Phasing and Frequency Matrix

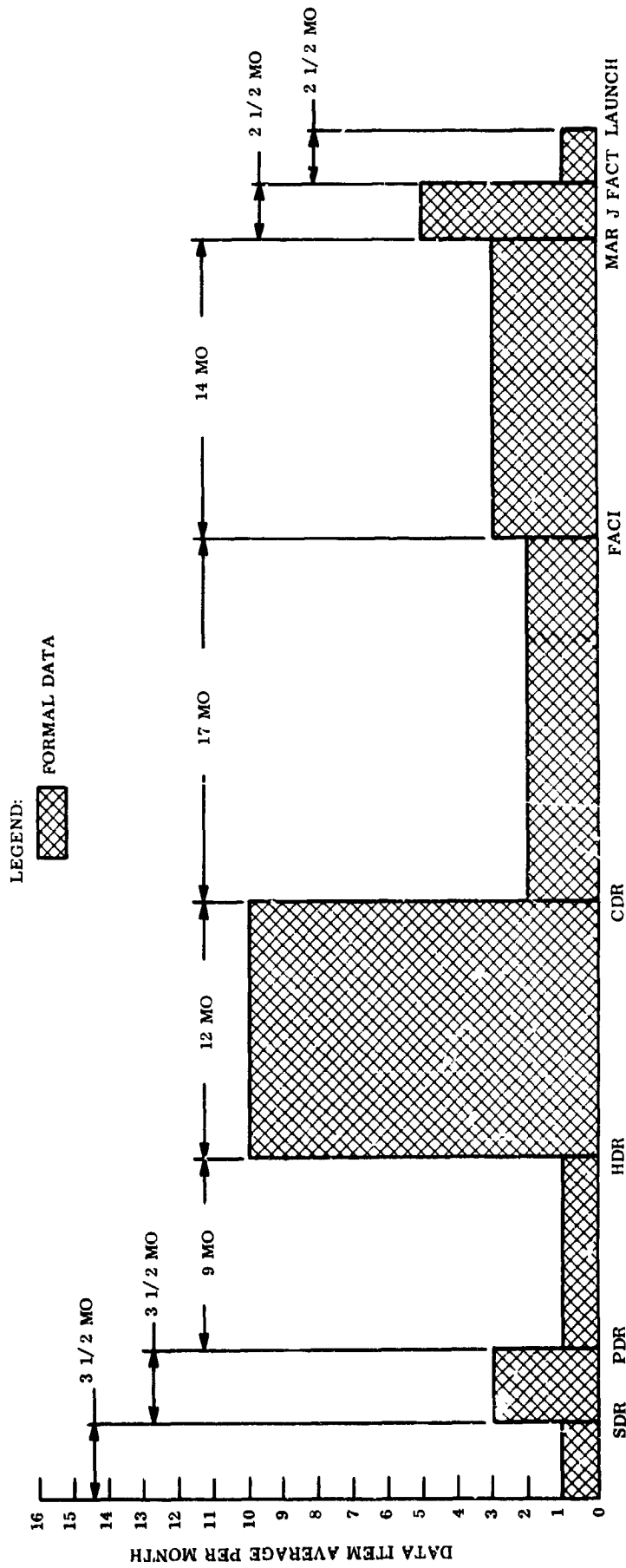


Figure B-3. Planetary Quarantine Data Item Density Profile