QUALITY ASSURANCE PROGRAM PLAN

APPLICABLE TO

THE KIPS

TECHNOLOGY VERIFICATION

PHASE

MASTER

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PLAN NO. QA-04

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DATE 4 October 1978

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KIPS QUALITY PROGRAM PLAN

1. INTRODUCTION

1.1 SCOPE

This Quality Program Plan describes the manner in which the Energy Systems Unit of the Advanced Technology Group Division of Sundstrand Corporation applies its Quality Assurance Program and Systems to control and assure compliance to the Quality requirements in accordance with NRA-1, dated July 1, 1977, in support of the Kilowatt Isotope Power Systems (KIPS) Program Technology Verification Phase.

The format of NRA-1 has been employed in the Quality Program Plan to allow for ease of cross referencing.

A Matrix cross referencing paragraphs of this Plan to the Sundstrand Quality Assurance Manual is included herein.

1.2 APPLICABILITY

The applicability of this plan will be as defined herein.

1.3 RELATION TO OTHER CONTRACT REQUIREMENTS

The KIPS Quality Program Plan is to complement other contract requirements. This plan is constructed to be cost effective by utilizing existing organizational controls. Duplication of effort is avoided.

1.4 ACTIONS AND PREROGATIVES OF THE GOVERNMENT

The right of the Department of Energy (herein called DOE), to source inspection at Sundstrand or at major sub-contractors is acknowledged.

1.5 APPENDIX A, "DATA PACKAGE"

A suitable data package will be provided at the termination of contract or the conclusion of the Technology Verification Phase as defined by Table I (attached).

2. MANAGEMENT AND PLANNING

2.1 QUALITY ASSURANCE PROGRAM

The quality effort concerning the Technology Verification Phase hardware procurement, fabrication, assembly and test will be a positive effort to establish a viable quality program.

Quality Assurance Engineering activities will include but not be limited to the following:

- a) Evaluate design compatibility with fabrication and inspection capabilities. Instigate corrective actions as necessary.
- b) Evaluate/audit vendor activity as applied to unique program requirements.
- c) Review component and GDS testing procedures. Monitor testing.
- d) Assure documentation of procurement, fabrication, assembly and test is sufficient for program evaluation requirements.
- e) Verify that procedures established are of sufficient detail to ensure reproducibility.
- f) Coordinate corrective actions.
- g) Document the above to Management.

The Quality Assurance Engineering involvement in G.D.S. design was initiated with the first design review. Quality Assurance Engineering shall continue to be available to advise and monitor the design during the Technology Verification Phase.

Quality Assurance Engineering shall review all items defined by Reliability Engineering as critical and shall require additional material and/or process controls where appropriate.

During the Technology Verification Phase, some experimental hardware shall be used . The Quality Assurance requirements for the experimental hardware will be determined jointly by Project Engineering and Quality Assurance Engineering.

2.2 ORGANIZATION

The Quality Assurance Manager, Rockford, has complete responsibility for the administration and direction of the Quality Assurance efforts on the KIPS Program. He shall regularly report directly to high management.

The primary manufacturing facility for this program will be located at Plant 6, Rockford, Illinois. The responsibility of the implementation of the Standards, Procedures and Policies developed rests with the Rockford Quality Assurance Manager, Operations Division.

The organization of the Energy Systems Division and the Operations Division is depicted on the chart herein.

The major responsibilities of the Rockford Quality Assurance Manager are as follows:

- a. Proposal/Contract Review
- b. Quality Program Plan Development
- c. Customer Coordination
- d. Special System Audits
- e. Drawing and Procedure Review for specific program requirements
- f. Reports

- g. Program Q. A. Management
- h. Purchase Order Review
- i. Vendor Control
- j. Audits
- k. Drawing Review
- l. Procedure Approval
- m. Inspection Planning
- n. Gage Design and Procurement
- o. Change Board
- p. Record Retention
- q. NDE Engineering
- r. Process Control
- s. Nonconforming Material Review
- t. All other functions relating to part fabrication, assembly and tests.
- u. Special Traceability Systems
- v. Contract Deliverable Data Requirements

2.3 PLANNING

The planning effort defined in this plan shall be supplemented by procedures, instructions, job instruction sheets and other appropriate documents as applicable. Additional modifications and/or additions to the assembly or test instructions may be made by Project Engineering to accomodate experimental hardware and testing necessary as a part of this phase. Quality Assurance Engineering will review these changes as required for adequacy and assure their proper documentation.

This plan and subsequent revisions shall be submitted to DOE for formal review and approval.

2.3.1 Quality Program Plan content is as follows:

2.3.1.1 Applicable sections of the Sundstrand Quality Assurance Manual are referenced herein by Section, Procedure, and/or Instruction number.

2.3.1.2 Departmental responsibilities will be as defined by this plan, referenced procedures and organizational charts.

2.3.1.3 Quality Task descriptions, policies, and procedures are included in Section 2.2.

2.3.1.4 The Sundstrand coordinators for interface on matters concerning quality are:

DOE-Sundstrand	Special Programs Quality Assurance Eng. Mgr.
Sundstrand-Suppliers	Vendor Quality Assurance
Sundstrand-Sundstrand	Special Programs Quality Assurance Eng. Mgr.

DOE - Sundstrand's Suppliers - Not anticipated except on major subcontract with Teledyne in which case DOE shall have direct access for routine matters. Quality problems should be coordinated with the Special Programs Quality Assurance Engineering Manager.

2.3.1.5 The flow of fabrication and assembly will be controlled by Route Cards prepared by Manufacturing Engineering with inspection point requirements verified by Quality Planning and Quality Assurance Engineering.

Details of fabrication and assembly except as noted in paragraph 2.3 will be described in Job Instruction Sheets and in referenced Process Procedures. Quality Planning and Quality Assurance Engineering review Route

Cards, JIS's and subsequent revisions for approval.

From these documents, and the print Quality Planning prepares an inspection JIS. The inspection JIS does not require approval outside of the Quality Organization.

2.4 TRAINING

All NDE personnel shall be qualified and certified in accordance with Q. A. Procedure 7.09.

All Welding personnel shall be qualified and certified in accordance with Q. A. Procedures and Q. A. Instructions.

Welding Inspection shall be accomplished in accordance with Q. A. Procedure 7.08 and applicable Q. A. Instructions.

Soldering personnel shall be trained and certified in accordance with Q. A. Instruction 4.04.15.

All personnel performing helium leak checks shall be qualified and certified in accordance with Q. A. Procedures and Q. A. Instructions to be developed by Sundstrand Aviation Quality Assurance.

Assembly & Test personnel will be indoctrinated to unique requirements applicable to the KIPS Program.

2.5 CERTIFICATION OF PERSONNEL

Included in 2.4 of this Quality Plan.

2.6 RECORDS

Records of Special Processes training testing and certifications shall be maintained by Sundstrand Quality Assurance.

Recertification shall be as required in 2.4.

2.7 DOCUMENTATION

2.7.1 POLICIES AND PROCEDURES

This quality plan is augmented by Standard Policy Documents, Instructions and other technical documents.

2.7.2 QUALITY RECORDS

Sundstrand Aviation Quality Assurance shall be responsible for the maintenance of quality records applicable to program requirements. These records shall be maintained per Sundstrand Q. A. Procedure 1.06. Quality records shall be presented to DOE for review upon request.

2.7.3 QUALITY STATUS REPORTS

Sundstrand Quality Assurance Engineering shall submit monthly reports of all quality activities to program management for incorporation into monthly reports to DOE. The reports shall include a brief narrative of all Quality Program accomplishments, progress and action item objectives. MRB files shall be audited monthly to determine trends. MRB statistics and trends shall be incorporated into monthly report. Copies of Sundstrand Malfunction & Trouble Report/Event Record (Form 6811) will be included in the Monthly Report. Summaries of unique program audits shall be incorporated into the appropriate monthly reports.

2.7.4 AUDITS & REVIEWS

2.7.4.1 Quality Audits

Routine company wide audits will be conducted in accordance with Q. A. Procedure 1.07 and Q. A. Instruction 1.07.01 by Sundstrand Quality Assurance on a frequency of no less than once a year. Summaries of these audits will be available for on-site review.

Unscheduled and/or special audits shall be conducted in a manner similar to the above mentioned routine audits as directed by the Q. A. Manager. To avoid duplication of effort only program unique features must be audited on the minimum annual basis. Summaries shall be provided to DOE.

2.7.4.2 Management Reviews

Quality documentation and reports shall provide management visibility into the overall quality effort. Formal Quality Program reviews will be held when deemed necessary by management.

3. QUALITY ASSURANCE PERSONNEL PROGRAM PARTICIPATION AND TECHNICAL DOCUMENT REVIEW

3.1 TECHNICAL DOCUMENTS

The required documents are prepared as standard operating practice. Sundstrand specifications and standards shall require the review and approval of Sundstrand Quality Assurance.

3.2 QUALITY REVIEWS

The Quality Assurance Engineering objectives described in Paragraph 2.1 above apply. Quality Assurance Engineering will participate in all phases of the KIPS Program activity, including review and documentation (i.e., Engineering Drawing Review and Sign-Off, MTR Review, etc.).

The experimental "EP" drawings will be reviewed by Quality Assurance Engineering. The extent of Quality involvement and documentation required on "EP" hardware during its manufacture and assembly will be jointly determined by Project Engineering and Quality Assurance Engineering.

3.3 QUALITY SUPPORT TO DESIGN REVIEWS

Quality Assurance Engineering shall participate in all design and change review activity related to KIPS and shall have responsibility to notify the Program Manager and Quality Assurance Manager of proposed changes which affect interface characteristics.

All drawings and changes shall require Quality Assurance approval. Except for the "EP" hardware, full compliance to Q. A. Procedure 2.02 and Q. A. Instruction 2.02.06 shall be required. Higher assemblies containing "EP" hardware will be treated as normal production hardware but with the necessary documentation of the deviations.

3.4 TECHNICAL DOCUMENT CONTROL

Each department which maintains a controlled drawing file is charged with the responsibility for filing new drawings distributed to them and removing obsolete ones. Sundstrand Quality Assurance audits controlled drawing files for conformance to current requirements. Audits are conducted on a random basis at an interval not to exceed one year. Where a file is found deficient, additional follow-up audits are made.

3.4.1 EFFECTIVITY

Shall comply with Sundstrand Policy 4-02, 4-3, 4-05 and 4-06.

4. TRACEABILITY AND IDENTIFICATION

4.1 TECHNICAL DOCUMENTATION

Methods, location and information to be employed in marking shall be defined on the engineering print per Sundstrand PN17.50 and Sundstrand Q. A. Procedure 4.06.

4.2 TRACEABILITY

Records for articles and materials shall indicate applicable part or

type numbers and detailed identification. Records shall provide the capability of tracing the material from which the fabrication originated to determine the location of like articles or raw materials within a level of process or assembly.

GDS non-critical hardware may not have full material traceability.

4.3 IDENTIFICATION METHODS

Identification methods will be as defined by engineering print and Sundstrand Q. A. Procedure 4.06.

5. PROCUREMENT

5.1 GENERAL

Sundstrand accepts the responsibility for the adequacy and quality of all contractor purchased articles, materials and services.

5.2 SELECTION OF CONTRACTOR PROCUREMENT SOURCES

Sources shall be selected in accordance with Sundstrand Q. A. Procedure 3.01.

5.3 PROCUREMENT DOCUMENTS

5.3.1 REVIEW

Quality Assurance Engineering shall review purchase requests and purchase orders. Revisions to the quality requirements imposed on purchase requests will require Quality Assurance approval.

5.3.2 CONTENTS

Review of procurement contents will be in accordance with Sundstrand Q. A. Procedure 3.01. Government Source Inspection (GSI) is not contemplated except on the major sub-contract to Teledyne. All applicable program requirements shall be imposed on the Teledyne contract. Subcontractor exceptions will require DOE approval prior to Sundstrand acceptance.

Control of age sensitive materials depends on many factors but at a minimum material is dated upon receiving. Material drawn from stock is examined to assure useful life prior to use. Out of date materials are scrapped.

Sundstrand's proprietary processes shall be open for DOE review where required. Use of vendor proprietary products and/or processes will be discouraged. Where requirements exist for proprietary products and/or processes and where a high degree of Quality cannot be assured by examination and testing, then Sundstrand shall attempt to secure one of the modes of assurance in NRA-1, Paragraph 5.3.2c. (14), a. through 3., if such can be achieved with minimal impact on cost, schedule, and other program requirements.

5.4 CONTRACTOR QUALITY ASSURANCE PERSONNEL AT SOURCE

As defined by Sundstrand Q. A. Procedure 3.01 and Sundstrand Q. A. Instruction 3.01.05.

5.5 GOVERNMENT SOURCE INSPECTION

It is acknowledged that GSI does not relieve Sundstrand of the responsibility for inspection. Reference Section 5.3.2 for additional information.

5.6 RECEIVING INSPECTION

Receiving Inspection shall be performed in accordance with Sundstrand Q. A. Procedure 3.02. Periodic disassembly per Section 5.6 (4) will not be performed unless specific purchased assemblies requiring such inspection are identified by Sundstrand Engineering.

Receiving Inspection shall at a minimum require that age sensitive

materials be marked with cure date and discard date.

Raw material random samples shall be periodically obtained to allow for verification of reported chemical and mechanical properties prior to material release.

5.7 RECEIVING RECORDS

Records as required in Section 5.6 are maintained, however, traceability to unserialized non-critical components when more than one lot is received may not be maintained once acceptance is assured.

5.8 COORDINATION OF CONTRACTOR - SUPPLIER INSPECTION AND TESTS

Supplier coordination will be as defined in Section 5.4.

5.9 NONCONFORMING PROCURED ITEMS

Nonconforming items shall be handled in accordance with Sundstrand Q. A. Procedure 6.01. Resubmittal of rejected items requires the supplier to identify the reject tag number. Only items for which acceptable rework is possible are eligible for resubmittal. Receiving Inspection verification shall be by reinspection (physical characteristics) and/or vendor documentation as applicable.

Should a supplier wish to use nonconforming items, the supplier must submit a "Vendor's Request for Material Review Action", Form 6197B.

Due to the limited quantities and the experimental nature of some of the hardware, supplier corrective action may not always be obtainable. However, the nonconformance will always be fully documented for possible future action.

5.10 CONTROL OF PROCURED ARTICLES AND MATERIALS

Procured items shall be controlled in accordance with Sundstrand Q. A.

Procedure 4.05 and Sundstrand Q. A. Instruction 4.05.01.

6. FABRICATIONS AND ASSEMBLY

6.1 PLANNING

Planning shall be performed in accordance with the standard route card and job instruction sheet (JIS) system which shall provide sequence and instruction for fabrication, assembly and test inspection operations. Quality Assurance Engineering will monitor inspection JIS's for completeness and compliance to program objectives.

6.2 ARTICLE AND MATERIAL CONTROLS

Items shall be controlled by Route Cards with identification control as defined by Engineering prints being specified.

6.3 FABRICATION AND ASSEMBLY PROCESSES

Fabrication and assembly processes shall be controlled as defined by Section 6.1. Processes and Testing shall be performed to written procedures which shall be reviewed by Quality Assurance. Approval for use shall require that environmental considerations be controlled and that special fixtures be identified.

Process flow charts shall not be utilized due to hardware lot sizes.

6.4 PROCESS QUALIFICATION

Standard manufacturing practices are controlled by Sundstrand Production Procedures (PN's).

Use of new processes that are developed for KIP's application and where high quality cannot be verified after completion, shall be qualified and require the approval of Q. A. Engineering and Project Engineering. A list of these processes shall be maintained by Q. A. Engineering and reported in status report.

6.5 CLEANLINESS AND CONTAMINATION CONTROL

Sundstrand Quality Assurance shall require facilities cleanliness and related cleanliness operations as required to obtain cleanliness requirements as specified on the engineering prints per CP14.57-01, the KIPS General Precision Cleaning Document, or the supplements thereof. Should problems related to cleanliness arise during the course of the program Quality Assurance shall impose such additional requirements as experience indicates is required.

6.6 COMPLETED END ITEMS

Test and inspection of end items prior to delivery shall be performed in accordance with Engineering prints and design specifications.

6.6.1 Modification, Repairs or Replacements

Modification, repair shall be performed in accordance with written instructions. Quality Assurance shall inspect and shall verify acceptance of the activity. Retest shall be as determined by Project Engineering and shall require Quality Assurance concurrence.

6.7 WORKMANSHIP STANDARDS

Workmanship is controlled by drawings, process procedures and formal inspection instructions.

7. INSPECTION AND TESTS

7.1 INSPECTION AND TEST PLANNING

Test Engineering prepares test plans which require the review and approval of Sundstrand Quality Assurance prior to use. Inspection Planning is the responsibility of Sundstrand Quality Planning and includes all NDE's, specifications and inspections for production hardware. Experimental hardware inspection requirements will be

defined by joint direction from Project Engineering and Quality Assurance Engineering.

7.2 INSPECTIONS AND TESTS

7.2.1 General Requirements

Sundstrand Quality Assurance shall verify that testing is in accordance with approved procedures, that calibrated instrumentation is employed and that nonconformances are documented. Cause and corrective action investigation will be made for all nonconformities occurring during GDS qual tests.

7.2.2 Documentation

Procedures shall include accept/reject criteria and the documentation requirements. Sundstrand Quality Assurance shall review procedures and conformance.

Nonconformities and events (other than problems) encountered during assembly and test of hardware in-house will be documented per QA Instruction 5.01.08 utilizing the Malfunction Trouble Report/Event Record (Form 6811).

7.2.3 Records

Applicable quality records shall be maintained in accordance with the standard record retention system per Sundstrand QA Procedure 1.06.

7.2.4 Inspection and Test of Major Deliverable Systems

Sundstrand Quality Assurance shall review proposed procedures for compliance to contract requirements.

Project Engineering shall coordinate test operations which incur abnormal risk with the Quality Assurance Manager. The ap-

plicable tests may be subject to formal rehearsal with surveillance by DOE prior to proceeding with actual test as determined by Sundstrand Project Engineering and Quality Assurance Engineering.

7.2.5 Contractor Quality Assurance Actions

Prior to Testing:

- a. Sundstrand Quality Assurance (QA) shall verify that applicable inspection and test documents are complete, available and unambiguous.
- b. QA shall verify that requirements for control of test articles are met and that test constraints are resolved.
- c. QA shall ensure test articles are properly identified.
- d. QA shall verify configuration of test articles.
- e. QA shall verify GSE and article configuration consistency.
- f. QA shall verify that test equipment is calibrated.

During Testing:

- a. QA shall ensure that testing is accomplished in accordance with test procedures.
- b. QA shall verify accurate and complete data is recorded.
- c. QA shall document repair and/or rework.
- d. QA shall document nonconformances and shall participate in their disposition.

Subsequent to Testing:

- a. QA shall ensure proper disposition of articles.
- b. QA shall document any additional nonconformances and participate in their disposition.
- c. QA shall ensure remedial and preventive action relative to

nonconformances is in effect.

- d. QA shall verify that test results are accurate, complete and traceable to the unit tested.

8. NONCONFORMING ARTICLES AND MATERIALS

8.1 CONTROLS

Control, review and disposition of nonconforming material shall be performed in accordance with Sundstrand QA procedures 5.01 and 6.01. Sundstrand Instructions QA 5.01.10 and 5.01.16 also specifically apply.

8.2 INITIAL REVIEW DISPOSITIONS

Initial review is covered in Section 3.3 of Sundstrand QA Procedure 6.01.

8.3 MATERIAL REVIEW BOARD

MRB shall conform to Sundstrand Q. A. Procedure 6.01. DOE review will not be required prior to implementing MRB actions.

8.3.1 Membership

Sundstrand reserves the right to change MRB membership without DOE approval

DOE representative on MRB is accepted only if a representative is available for timely disposition.

8.3.2 Responsibility

Responsibility is as defined in Section 8.1.

8.3.3 MRB Disposition

Disposition is as defined in Section 8.1.

8.4 NONCONFORMANCE REPORTING AS CORRECTIVE ACTION

8.4.1 Nonconformance Reporting

Reporting shall be in accordance with Sundstrand Q.A. Instruction

6.01.01. Detailed MRB action shall be provided for DOE on site review. Formal summaries will be transmitted as part of quality status reports.

8.4.2 Corrective Action

Corrective action is as defined in Section 8.4.1.

9. CALIBRATION AND STANDARDS

9.1 GENERAL

Sundstrand Quality Assurance shall be active in the selection, calibration, adjustment, maintenance and control of inspection, measuring and test equipment per applicable policies and instructions in Section 8 of the Sundstrand Quality Assurance Manual.

9.2 EQUIPMENT EVALUATION

Special test equipment such as checkout consoles shall be tested to assure that the objective of the test procedure is obtainable.

9.3 EQUIPMENT CONTROL

Control shall conform to Sundstrand Q.A. Procedure 8.01.

9.4 CALIBRATION STANDARDS

Sundstrand or outside calibration standards may be used and shall be traceable to NBS. Environmental controls shall be exercised as necessary.

9.5 DISCREPANT EQUIPMENT

In order to provide cost effectivity only those gages and/or test equipment which are special equipment assigned to the KIPS Program for end item acceptance will be controlled for the purpose of identifying possible discrepant items due to out of calibration conditions. When discrepancies in inspection, measuring and test equipment are found at

calibration, a Malfunction Trouble Report/Event Record (Form 6811) will be initiated to document and determine what corrective action and/or retesting is required.

10. STAMPS

10.1 STAMP CONTROL

Sundstrand Quality Assurance shall control stamps in accordance with Sundstrand Q. A. Procedure 1.04 and Sundstrand Q. A. Instruction 1.04.01 and 1.04.02.

It is the obligation of inspection supervisors to determine inspector qualifications and to allow only qualified personnel to perform inspection.

The qualifications and training of all personnel, to whom stamps are issued, are not necessarily documented. Documentation is required for certain skills (see 2.4 of this plan) and is available for DOE review on-site. Much training is on the job. Close supervision is maintained on the job to assure proper training, qualification and performance. This process gives the supervisor insight to skills and allows proper job assignment.

Special training is conducted from time to time as required without formal documentation, to insure the concerned supervisor that the skills required are available. As an example when new and complex equipment is purchased the vendor would conduct training classes.

10.2 STAMP RESTRICTION

Stamps are regulated per Sundstrand Q. A. Procedure 1.04. Sundstrand Q. A. Instruction 1.04.01, Appendix I contains illustrations of typical Sundstrand stamps. "DOE" designation is not utilized.

11. HANDLING, PRESERVATION, PACKAGING, STORAGE AND SHIPPING

11.1 HANDLING

Requirements for special handling shall be at the direction of Project Engineering, Manufacturing Engineering and Quality Assurance. Sundstrand Quality Assurance Engineering shall have ultimate responsibility for verifying that acceptable handling procedures are implemented. Quality shall review and approve all special handling procedures prior to use.

11.2 PRESERVATION, PACKAGING AND STORAGE

Special requirements for preservation, packaging and storage shall be denoted on the engineering drawing.

When not specified, standard requirements shall apply.

Quality Assurance shall verify compliance to special and standard requirements.

12. STATISTICAL QUALITY CONTROL AND ANALYSIS

12.1 GENERAL

Sampling plans used by Sundstrand are described in Sundstrand Q.A. Instruction 3.02.08, 4.01.02 and 4.02.03.

TABLE I

DATA PACKAGE REQUIREMENTS

The Data Package shall consist of the following:

1. Title Page
2. Index
3. Operating Log
4. Bill of Materials
5. Record of As-Built-Configuration
6. Replacement Record - See Operating Log
7. Weight and Balance - See Engineering Report
8. Test Data and Procedures
9. MRB Records
10. Drawings - Top and first tier only with product specifications
11. Operating Instructions for GDS
12. MTR and Event Records

KIPS ORGANIZATION

The accompanying chart is presented to show the Sundstrand organization elements which are directly involved in the KIPS program.

The KIPS program is in the Energy Systems Unit of the Sundstrand Corporation. The Program Manager is directly responsible to the Energy Systems General Manager for the successful operation of all aspects of the program.

The three product line units, Aviation Mechanical, Electric Power and Energy Systems, in the Advanced Technology Group are shown along with the Operations unit. The Operations unit supports the three product line units in the functional areas of Engineering (Research, Test Design), Production (Material, Quality Assurance, Manufacturing) and Administration (Data Control, Management, Accounting, Pricing).

For specific programs such as KIPS, it is the responsibility of the Reliability, Quality Assurance and Hardware Managers to assign individuals to support the program and functionally report to the Program Manager. For major subcontractors such as Teledyne, the Materials Department of the Operations unit is responsible for assigning an individual to the program to perform the contractual interface function with the subcontractor.

In the Operations unit, the Vice President of Engineering is responsible for the research, test and design functions. Due to the nature of the KIPS program, a Research Engineering Manager has been assigned to functionally work within the program organization. The test and design functions are directed by task assignment originating from the KIPS Project or Research Engineering Managers.

Likewise, the Contracts Manager in the Energy Systems section has assigned Program Control and Cost Control personnel to functionally report to the KIPS Program Manager.

SUNDSTRAND - KIPS PROGRAM

KIPS PROGRAM FUNCTIONAL ORGANIZATION

QUALITY ASSURANCE PROGRAM MATRIX

DATES 7-22-77
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R. S. Ballard

PROGRAM:

KIPS

PROGRAM REQUIREMENT		SUNDSTRAND DOCUMENT NUMBER	
NRA-1 Paragraph #	Q. A. Procedure	Q. A. Instruction	Quality Document
1.	N/R		
1.1 thru 1.5	N/R		
2.	Section 1.0		
2.1	Section 2.0		
2.2	Section 1.0 Charts: C-01 - C-05		
2.3	1.01		
2.3.1			QA- 04 (KIPS Quality Plan)
2.3.1.1 thru 2.3.1.5	Sections 1-10		QA- 04 (KIPS)
2.4	7.08 1.02	4.04.15 7.08.01 7.09.01 7.09.01 Denver 7.09.02 7.09.02 Denver	
2.5	(Same as 2.4)		
2.6	(Same as 2.4)		
2.7	1.01	1.01.01	
2.7.1	1.01	1.01.01

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NRA-1 Paragraph #	Q.A. Procedure	Q.A. Instruction	Quality Document
2.7.2	1.06	1.06.02	
2.7.3	6.01	5.01.08	QA-04 (KIPS)
2.7.4	1.07		
2.7.4.1	1.07	1.07.01 1.07.06 Denver	
2.7.4.2	1.07		
3.1	2.01 2.02 2.04		
3.2	2.01 2.02 2.04		
3.3	2.02	2.02.06 2.02.01 Denver	
3.4		2.02.03 2.02.01 Denver 2.02.02 Denver	
3.4.1		2.02.01 2.02.01 Denver 2.02.02 Denver	4-02 4-05 4-3 4-06
4.	4.06		
4.1	4.06		
4.2	1.06

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NRA-1 Paragraph #	Q. A. Procedure	Q. A. Instruction	Quality Document
4.3	4.06		
5.	4.06		
5.1	4.06		
5.2	3.01	3.01.03 3.01.06 Denver 3.01.06	
5.3	2.02 3.01		
5.3.1	2.02 3.01	2.02.03 3.01.06	002-1
5.3.2	3.01	3.02.02 Denver	002-1
5.4	3.01	3.01.04 3.01.06 Denver	
5.5	3.01		
5.6	3.02	3.02.01 Denver 3.02.02 Denver	002-14
5.7	1.06		
5.8	3.01	3.01.10 3.01.05 3.01.08 3.01.06 Denver	
5.9	6.01	Directive (New) 6.01.--

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NRA-1 Paragraph #	Q. A. Procedure	Q. A. Instruction	Quality Document
5.10	4.05	4.05.01 Denver 4.05.01	
6.	2.04		
6.1	2.04 4.01		
6.2	5.01		
6.3	4.01 5.01		
6.4	2.06	1.04.06	
6.5		5.01.13 5.01.05	
6.6	5.01 5.02 5.03		
6.6.1	5.05	5.05.02	
6.7		5.01.05	
7.	2.04	5.01.05	
7.1	5.01 5.02	5.01.05	
7.2.	1.06 5.01 2.04 5.02	5.01.05

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NRA-1 Paragraph #	Q. A. Procedure	Q. A. Instruction	Quality Document
7.2.1	2.04 5.01 5.02	5.01.05	
7.2.2	2.04 5.01 5.02	5.01.05 5.01.08	
7.2.3	1.06	1.06.01 Denver	
7.2.4	5.01 5.02	5.01.05	
7.2.5	5.01 5.02	5.01.05	
8.		Section 6 of Q.A.I.	
8.1	5.01 6.01	5.01.10 5.01.16 6.01.02 Denver	
8.2	6.01	6.01.01 Denver	
8.3	6.01	6.01.02 Denver	
8.3.1	6.01		
8.3.2	6.01		
8.3.3	6.01		
8.4		6.01.01 6.01.03 Denver

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NRA-1 Paragraph #	Q. A. Procedure	Q. A. Instruction	Quality Document
8.4.1		6.01.03 Denver 6.01.03, Appendixes I thru XI Denver 6.01.01	
8.4.2	(Same as 8.4.1)		
9.	Section 8 of Q. A. Manual		
9.1	8.01		
9.2	8.01		
9.3	8.01		
9.4	8.01	8.01.01 Denver	
9.5	8.01	8.01.01 Denver	
10.	1.04		
10.1		1.04.01 1.04.02 1.04.03 Denver	
10.2		1.04.01 1.04.02 1.04.03 Denver	
11.	4.05 5.04		
11.1	4.05	4.05.01

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P. S. Ballou

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