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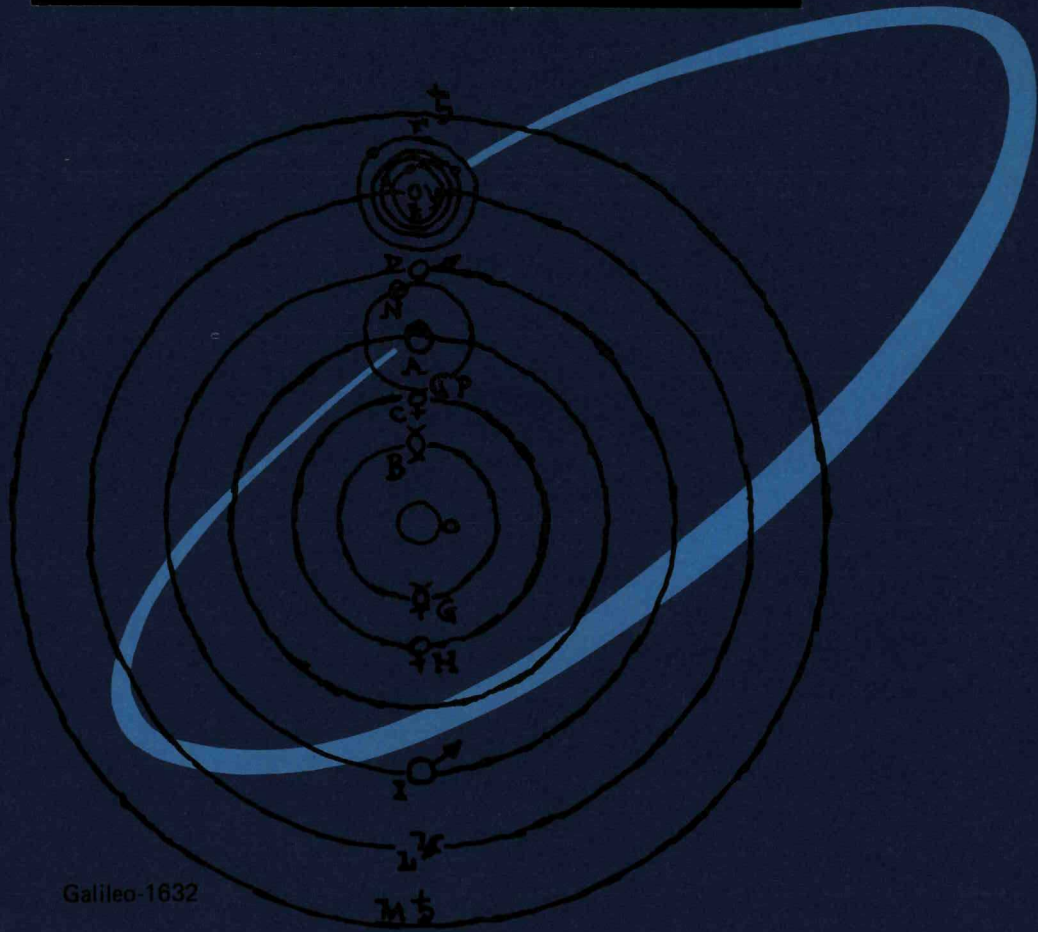
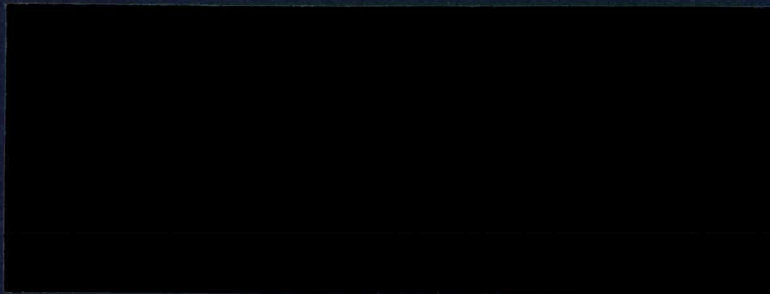
DE-ACC-U-78ET33009

8.3


SELENIDE ISOTOPE GENERATOR

for the

GALILEO MISSION



Galileo-1632

 TELEDYNE ENERGY SYSTEMS

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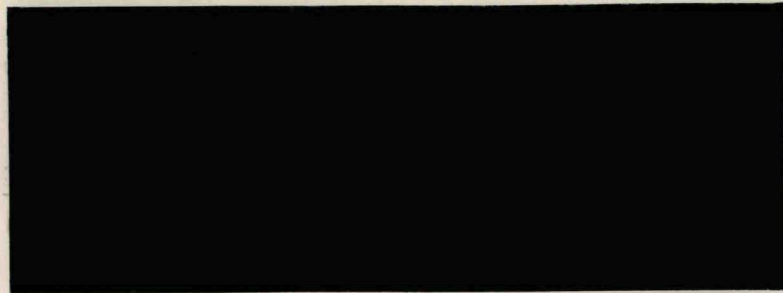
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Pictured on the cover is Galileo's drawing of the solar system, which includes the four satellites of Jupiter he discovered in the 1600's. A Renaissance professor, inventor and astronomer, Galileo perfected the telescope with which he made his Jupiter discoveries. The 1982 NASA mission to Jupiter is named in his honor. Like Galileo and his telescope, the NASA mission to the far reaches of outer space will be contributing to Mankind's never ending quest for knowledge.



SELENIDE ISOTOPE GENERATOR

for the

GALILEO MISSION

QUALITY ASSURANCE

PROGRAM PLAN

AUGUST 1978

TES-2865-13

MASTER

W. E. OSMEYER
PROGRAM MANAGER

Prepared for the U.S. Department of Energy
under Contract ET-78-C-01-2865

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PREFACE

This Quality Program Plan has been prepared to describe the quality activities of Teledyne Energy Systems associated with the development, production, test and delivery of hardware defined in Contract ET-78-C-01-2865. It is referenced under Task 9.0 of the SIG Program Plan, TES-2865-09 and is listed in the CDRL, Appendix III of the Statement of Work (TES-3077-46) for the Selenide Isotope Generator Phase III Program.

The objective of the Quality Program Plan is to establish and maintain an effective and economical quality assurance system to assure that end items are in accordance with contractual specifications. Section I.9 of Appendix A (Statement of Work) states: "The Contractor shall prepare, implement and maintain a Quality Assurance program in accordance with a DOE approved Quality Assurance Program Plan which, for purposes of this contract, the parties agree represent a modified compliance with the latest requirements of the latest NRA-1 in effect at the time of the contract issuance." NRA-1 sets forth general requirements for quality assurance programs covering a wide variety of nuclear systems and is sufficiently expansive in scope to outline the quality activities of a broad range of contractual efforts. This Quality Assurance Program Plan, including the individual Quality Directives (Quality Procedures referenced in various Quality Directives provide only historical foundations of Quality Policy and as such are not relevant to the specifics of this plan.) attached in Appendix I defines the quality activities that are to be accomplished under the current contractual work effort. The extent to which this Plan provides activity to accomplish the major intent of each section of NRA-1 is summarized in Table 1. NRA-1 however, provides only the skeletal foundation for the plan and it should not be construed that sections or portions not explicitly quoted are implied. The Plan will function as an independent and self-supportative document.

The format of this Quality Program Plan follows that of NRA-1, dated July, 1977. Each section of this Plan describes explicitly the purposes, implementation, and documentation of Quality activities related to the Quality Assurance and Control required for the achievement of an acceptable product quality.

TABLE 1

<u>Section</u>	<u>Title</u>	<u>Q. D.</u>	<u>Degree of * Conformance</u>
1.	Introduction	N/A	N/A
1.1	Scope	None	C
1.2	Applicability	None	P
1.3	Relation to Other Contract Requirements	None	P
1.4	Actions and Perogatives of the Gov't.	None	P
1.5	Appendix A, "Data Package"	N/A	C
2.0	Management & Planning	N/A	N/A
2.1	Quality Assurance Program	3.3,3.4,3.6,3.7,5.3	C
2.2	Organization	None	C
2.3	Planning	All**	P
2.4	Training	All	C
2.5	Certification of Personnel	5.3,9.1	C
2.6	Records	5.3,9.1	C
2.7	Documentation	N/A	N/A
2.7.1	Policies and Procedures	All	C
2.7.2	Quality Records	All	P
2.7.3	Quality Status Reports	None	P
2.7.4	Audits and Reviews	N/A	N/A
2.7.4.1	Quality Audits	5.3,9.1	P
2.7.4.2	Management Reviews	3.7	P
3.	Quality Review of Technical Documents	N/A	N/A
3.1	Technical Documents	None	C
3.2	Quality Reviews	2.2	P
3.3	Quality Support to Design Reviews	None	C
3.4	Technical Document Control	2.2,8.1	P
4.	Traceability and Identification	N/A	N/A
4.1	Technical Documentation	3.6,5.5,8.1,10.1	C
4.2	Traceability	3.6,5.5,8.1,10.1	C
4.3	Identification Methods	3.6,5.5,8.1,10.1	C
5.	Procurement	N/A	N/A
5.1	General	None	C
5.2	Selection of Contractor Sources	None	C
5.3	Procurement Documents	N/A	N/A
5.3.1	Review	8.1	P
5.3.2	Contents	8.1	P
5.4	Contractor Quality Assurance at Source	8.1	C
5.5	Government Source Inspection	N/A	C
5.6	Receiving Inspection	3.6,8.1	C
5.7	Receiving Records	3.6	C
5.8	Coordination of Inspections and Tests	8.1	C
5.9	Nonconforming Procured Items	3.3,3.6,3.7,8.1	C
5.10	Control of Procured Articles	3.3,3.6,3.7	C
6.	Fabrication and Assembly	N/A	N/A
6.1	Planning	5.5	P
6.2	Article and Material Controls	None	C
6.3	Fabrication and Assembly Processes	5.5	P
6.4	Process Qualification	2.2	P

<u>Section</u>	<u>Title</u>	<u>Q. D.</u>	<u>Degree of * Conformance</u>
6.5	Cleanliness and Contamination Control	5.3	C
6.6	Completed End Items	None	C
6.6.1	Modifications, Repairs or Replacements	None	C
6.7	Workmanship Standards	N/A	C
7.	Inspections and Tests	N/A	N/A
7.1	Inspection and Test Planning	5.5	P
7.2	Inspections and Tests	N/A	N/A
7.2.1	General Requirements	3.3,3.4,3.7,5.5,7.1,10.1	C
7.2.2	Documentation	5.5	C
7.2.3	Records	All	C
7.2.4	Inspection & Test of Major Deliverable System	N/A	P
7.2.5	Contractor Quality Assurance Actions	3.3,3.4,5.5,6.2	C
8.	Nonconforming Articles and Materials	N/A	N/A
8.1	Controls	3.3,3.4,3.5,3.6,3.7,5.5	C
8.2	Initial Review Dispositions	3.3,3.4	C
8.3	Material Review Board	3.7	C
8.3.1	Membership	3.7	C
8.3.2	Responsibility	3.7	P
8.3.3	MRB Dispositions	3.7	P
8.4	Nonconformance Reporting & Corrective Action	N/A	N/A
8.4.1	Nonconformance Reporting	3.3,3.4,3.6,3.7	P
8.4.2	Corrective Action	3.3,3.4,3.6,3.7	P
8.4.3	Quality Trend Visibility	N/A	N
9.	Calibration and Standards	N/A	N/A
9.1	General	7.1,8.1	C
9.2	Equipment Evaluation	7.1	C
9.3	Equipment Control	7.1	P
9.4	Calibration Standards	7.1	C
9.5	Discrepant Equipment	3.3,3.7,7.1	C
10.	Stamps	N/A	N/A
10.1	Stamp Control System	10.1	P
10.2	Stamp Restriction	10.1	C
11.	Handling, Preservation, Packing, Storage, Shipping	N/A	N/A
11.1	Handling	None	C
11.2	Preservation, Packaging and Storage	None	C
11.3	Shipping	5.5	C
12.	Statistical Quality Control and Analysis	N/A	N/A
12.1	General	4.1	P
12.2	Critical Parts, Materials and Processes	N/A	P

* C - Complete, P - Partial, N - None, N/A - Not Applicable

**All - as contained within this plan.

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SECTION 1. INTRODUCTION

1.1 SCOPE

This plan sets forth the general requirements for planning, managing, conducting and evaluating quality assurance activities. These requirements are based on proven quality practices and provide the means of control and verification whereby those responsible for project management can be assured that the quality required for safe, reliable and economical operation will be achieved.

1.2 APPLICABILITY

This plan is applicable to all deliverable hardware as defined in Attachment VII (Statement of Work) and test articles (those items which have a direct contribution to reliability and performance data). Test instrumentation and fixturing (i. e., load banks, Simpson meters, megohm bridges, etc.) are not subject to these controls when independent of the test articles. Tooling which is used as a basis for project acceptance is identified and inspected periodically for conformance to design requirements.

1.3 RELATION TO OTHER CONTRACT REQUIREMENTS

There is no duplication of contractor efforts due to overlapping and interfacing contractual requirements.

Teledyne Energy Systems' Quality Program Plan is in conformance with NRA-1 except as noted in Table 1 and Appendix III. The requirement stated in the first sentence of Section 1.3 of NRA-1 to wit, "The quality program requirements set forth in this publication shall be satisfied in addition to all requirements contained in the statement of work or in other parts of the contract, "will not be entirely adhered to. This Quality Program Plan explicitly defines the quality activities being performed and in some areas (as noted in Table 1 and Appendix III) portions of NRA-1 are not completely adhered to or implemented.

1.4 ACTIONS AND PREROGATIVES OF THE GOVERNMENT

The operations and work of Teledyne Energy Systems and its suppliers

are subject to evaluation, review, survey and inspection by the Government and/or its designated representatives to the extent of present contractual agreements between Teledyne Energy Systems and its suppliers. Extension of these prerogatives to subcontractors and suppliers for procurements is limited, on an individual basis, to that which can be negotiated with subcontractors and suppliers. The need for the use of second-tier proprietary processes and limited quantities occasionally restricts the extent to which these prerogatives are negotiable. Upon request, Teledyne Energy Systems and its suppliers shall provide representatives 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 their duties.

1.5 APPENDIX A, "DATA PACKAGE"

Details of the Data Package to be supplied are delineated within this appendix.

SECTION 2. MANAGEMENT AND PLANNING

2.1 QUALITY ASSURANCE PROGRAM

Teledyne Energy Systems shall establish, implement and maintain a documented quality assurance program that utilizes those organizational and functional disciplines necessary to furnish objective evidence of required quality throughout all phases of contract performance. Teledyne Energy Systems management shall place emphasis on product quality and shall actively support the development and maintenance of an effective and economical quality assurance program. Management shall be aware of and ascertain the effectiveness of the quality assurance program. Program management will be updated on the quality program at weekly program staff meetings and will receive copies of all non-conformance reports and any other quality reports and memos. Periodic Corrective Action Status Reports will also be forwarded to both program management and higher management for appraisal of corrective action measurements and the timeliness of their application. Quality Engineering will emphasize preventative measurements in all non-conformance reports and CAB reports in order to minimize recurrence of quality problems. QD's 3.3, 3.4, 3.6, 3.7 and 5.3 are directed towards achieving detection, correction and prevention of deficiencies.

2.2 ORGANIZATION

The organizational relationship of the Quality Operations Department within Teledyne Energy Systems is shown in Figures 1 and 2 and assures the organizational freedom and independence of the Quality Operations Department in its relationship to program management.

2.3 PLANNING

Teledyne Energy Systems' planning effort shall include all project activities affecting quality and shall cover all elements included in this document. Modifications and/or elimination of elements of NRA-1 which are not believed to be applicable are enumerated and described in Appendix III of this plan.

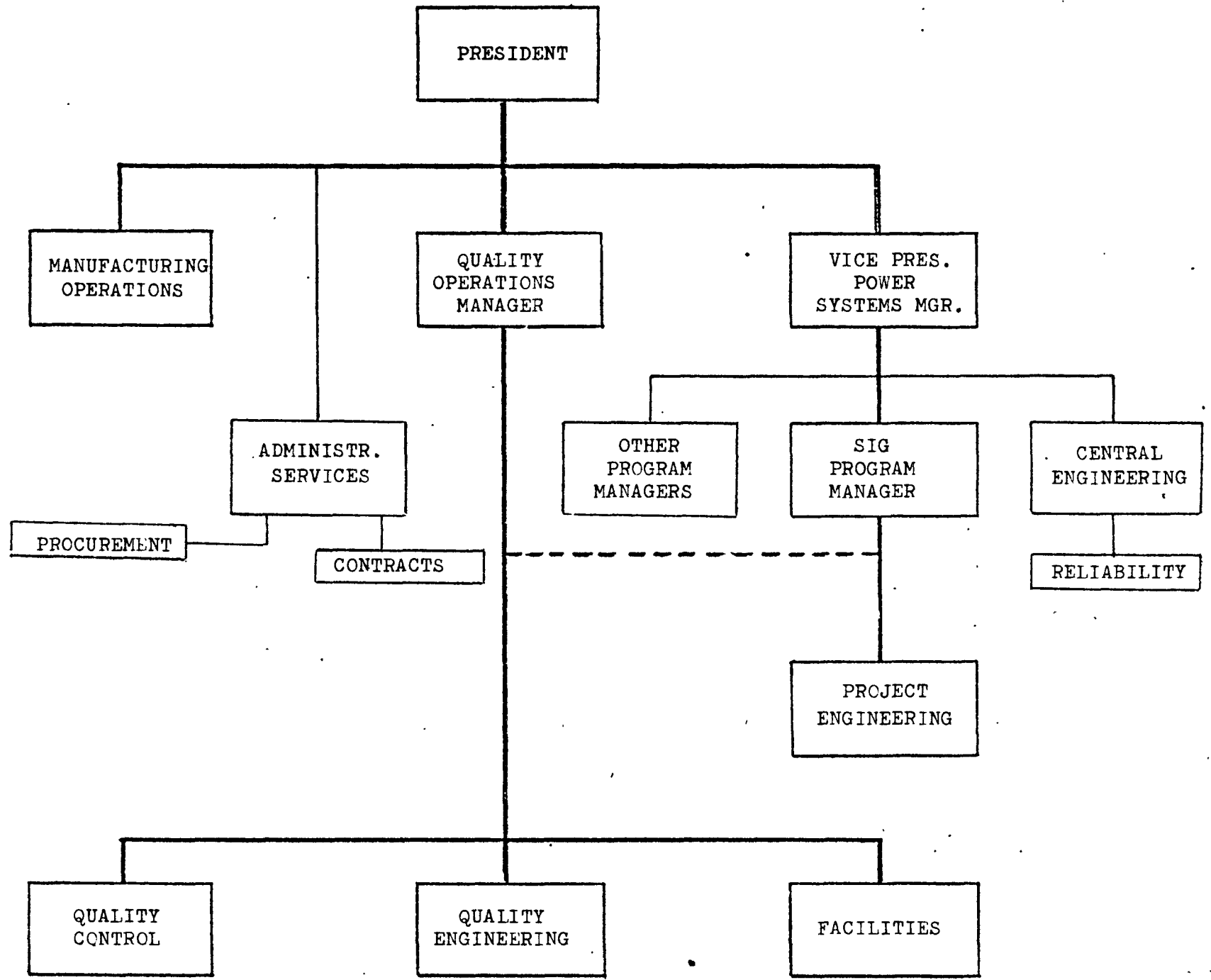


FIGURE 1. ORGANIZATIONAL INTERFACES FOR THE SIG PROGRAM

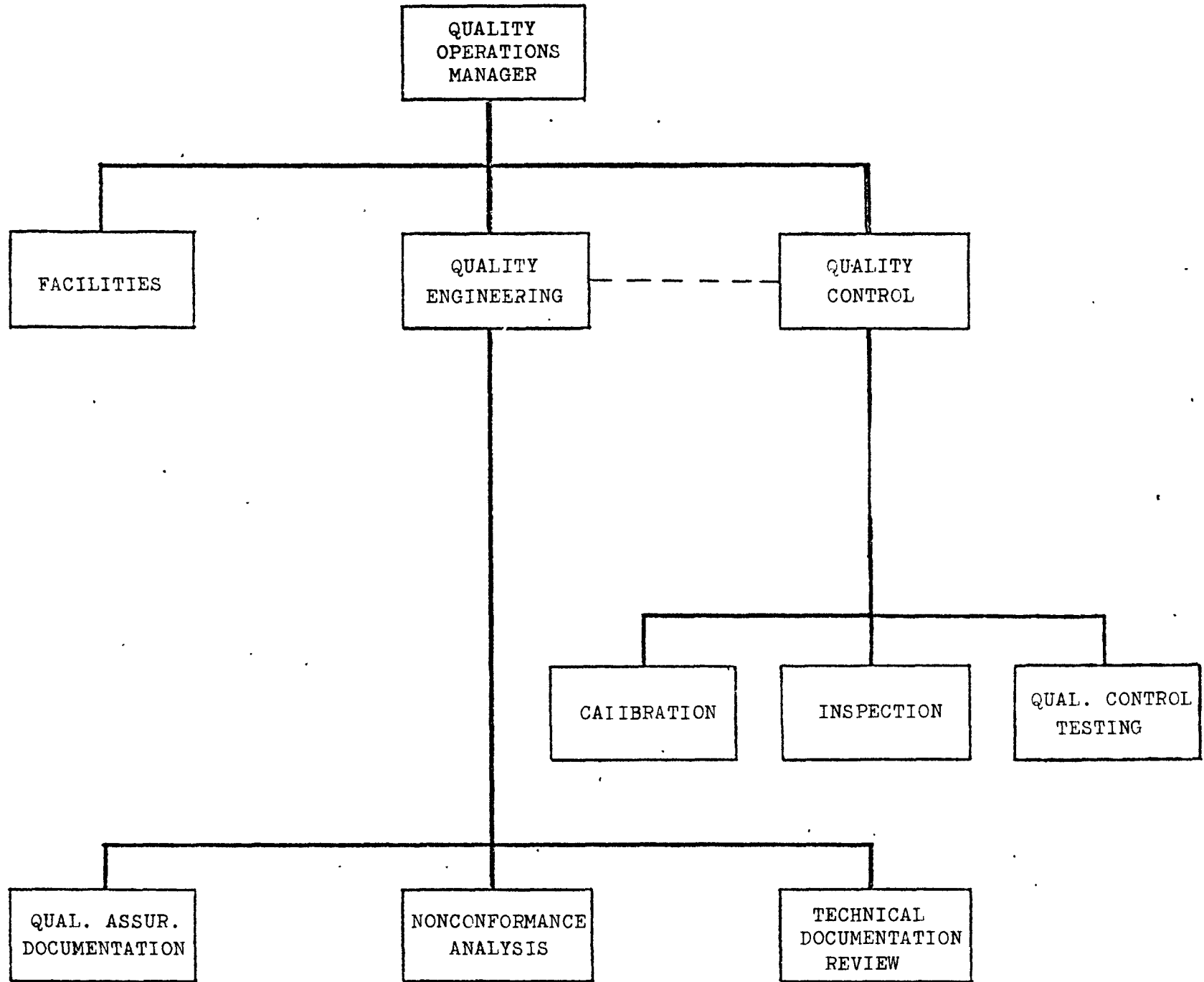


FIGURE 2. QUALITY ORGANIZATIONAL STRUCTURE (FUNCTIONAL)

2.3.1 QUALITY PROGRAM PLAN

Those elements of the plan which utilize existing Teledyne Energy Systems quality program documents are identified in Table 1, where references to specific existing Quality Directives are given.

Organizational structure and interfacing between various disciplines within Teledyne Energy Systems will be addressed and described within the SIG Program Plan, TES-2865-09. Those disciplines which are integral to the implementation of the quality program are identified and described within the aforementioned plan. Individual task management and execution is also delineated with the SIG Program Plan, TES-2865-09.

Administrative Planning within Teledyne Energy Systems will provide manufacturing flow charts (OSCAR) and schedules (Page and Line Schedules, ESD-97 (11-73)) indicating the flow of fabrication and assembly operations and related inspection and test points (including Government inspection and acceptance test surveillance).

Documents which are to be submitted to the Government for approval, review or information are identified in the CDRL, Appendix III of the Statement of Work (TES-3077-46) for the Selenide Isotope Generator Phase III Program.

After approval by DOE, subsequent changes to this Plan will require DOE approval prior to implementation. Changes to individual Quality Directives shall be submitted to DOE for information at least two weeks prior to implementation.

2.4 TRAINING

Teledyne Energy Systems shall have trained and competent personnel for implementing the quality program. Training shall consist of informal as well as formal instruction and written testing where applicable. Fabrication, inspection, test and quality assurance personnel will be knowledgeable and competent to perform their assigned duties relative to the program. Retraining shall be conducted, as appropriate, as the scope of the work effort and/or personnel changes. The program for those skills requiring training shall be documented and made available to the Government.

The program will list those activities for which personnel must be trained (as previously defined). This listing will be initiated and maintained by Quality Engineering and will be in addition to that contained within appropriate Quality Directives attached hereto.

2.5 CERTIFICATION OF PERSONNEL

Conformance with the requirements for personnel certification, recertification and record keeping is assured by the implementation of QD's 5.3 and 9.1. The audit of manufacturing processes as contained in Q. D. 5.3 will provide for assurance that pertinent techniques and skills are adequately defined and controlled.

2.6 RECORDS

Same as 2.5.

2.7 DOCUMENTATION

2.7.1 POLICIES AND PROCEDURES

It is the purpose of the Quality Program: 1) to establish and maintain an effective and economical quality control system that will provide quality consistent with specifications and known design intent, 2) to assure compliance with customers' and other applicable specifications, 3) to inspect, evaluate and control incoming and manufactured material, and 4) to provide documentation and procedural controls to assure that equipment delivered from Teledyne Energy Systems are of the quality required to meet contractual commitments. The Quality Operations Manager is delegated the authority to amend this policy as may be necessary from time to time by the issuance of Quality Directives. These same directives will provide definitions, procedures and instructions as applicable to accomplish the objectives of the overall quality program. They will be prepared in accordance with Q.D. 1.1. The latest revision control index is included as Appendix V.

2.7.2 QUALITY RECORDS

Teledyne Energy Systems shall maintain records sufficient to furnish documentary evidence of the performance of activities affecting the quality program,

and for use in management of the program. Records will be readily retrievable, identifiable and available to management, DOE and its designated representatives. Records which will be maintained are: quality program plans, procedures, instructions, training and certification records, design and quality review records, non-conformance reports, audit reports, corrective action reports, inspection procedures and data records.

2.7.3 QUALITY STATUS REPORTS

Quality status reports will be prepared as defined in the Contractor Data Requirements List, Appendix III of the Statement of Work (TES-3077-46).

2.7.4 AUDITS AND REVIEWS

2.7.4.1 QUALITY AUDITS

Teledyne Energy Systems Quality Engineering will plan and initiate audits of applicable procedures, processes and personnel which implement the quality program. When conditions warrant, unscheduled audits shall be performed in order to assess a suspected problem area. These audits will include review of Quality Directives as well as SIG specific processes and general manufacturing procedures. Audits will be performed in accordance with Q.D.'s 5.3 and 9.1. Not all activities which implement the quality program will be audited at least once a year (refer to Appendix III). All audits performed will be scheduled by Quality Engineering at the beginning of each calendar year. Audit results and corresponding corrective action, if any, shall be reported to DOE via the Monthly Quality Status Report as defined in the CDRL, Appendix III of the Statement of Work, Contract ET-78-C-01-2865.

2.7.4.2 MANAGEMENT REVIEWS

Management shall be aware of and ascertain the effectiveness of the quality program by informal communications, weekly program review meetings with project management personnel and distribution of Corrective Action Status Reports according to Q.D. 3.7. However, quality assurance review meetings are not held.

SECTION 3. QUALITY REVIEW OF TECHNICAL DOCUMENTS

3.1 TECHNICAL DOCUMENTS

All technical documents for the proper performance of the contract are generated as required.

3.2 QUALITY REVIEWS

Quality Engineering personnel participate in Documentation Review by implementation of Q. D. 2.2 and the SIG Program Documentation Plan (TES-2865-01). Independent review by other disciplines is performed to assure design compatibility with fabrication capabilities, testing and assembly, storage and shipment requirements. There are not, however, any quality procedures for assurance that safety requirements are specified and implemented.

3.3 QUALITY SUPPORT TO DESIGN REVIEWS

Quality personnel will participate in internal and planned DOE design reviews as scheduled in the Program Plan.

3.4 TECHNICAL DOCUMENT CONTROL

Proper control and issuance of technical documents is achieved by implementation of Q. D. 's 2.2, 8.1, and by the SIG Program Documentation Plan (TES-2865-01). Only the latest applicable drawings are used for product acceptance inspection. Inspection personnel will check the configuration record cards maintained by Quality Engineering to insure that they inspect hardware to the latest design revision. These cards are, in turn, maintained by reference to Engineering Job Sheets (I-E-124). However, no formal procedure is in effect to assure the retrieval of obsolete documents.

3.4.1 EFFECTIVITY

Effectivity of documents and changes thereto is controlled through the Configuration Management Plan (TES-xxxx-xx) and by implementation of the SIG Program Documentation Plan (TES-2865-01).

SECTION 4. TRACEABILITY AND IDENTIFICATION

4.1 TECHNICAL DOCUMENTATION

Methods and location of part or type numbers and identification is specified by the engineering, purchasing, manufacturing and inspection records (drawings and specifications, purchase orders, shop folders, production travelers, special instructions as appropriate, record requirements of Q.D.'s 3.6, 5.5, 8.1 and 10.1) generated and maintained during design, purchasing, fabrication, and inspection of hardware.

4.2 TRACEABILITY

In addition to those documents listed in 4.1 above, Engineering will specify traceability requirements as required in separate engineering drawings or specifications.

4.3 IDENTIFICATION METHODS

Identification shall be maintained where required by application of the control documentation noted in 4.1 and/or date codes, and/or lot numbers, and/or serial numbers assigned to components and assemblies by Quality Engineering.

SECTION 5. PROCUREMENT

5.1 GENERAL

Teledyne Energy Systems is responsible for the adequacy and quality of all purchased articles, materials and services.

5.2 SELECTION OF CONTRACTOR PROCUREMENT SOURCES

Quality participates in the selection of procurement sources. Documentation for the selection and acceptability of procurement sources (single source or multiple) is maintained by Procurement (Purchasing Policy and Procedure Manual, Index Nos. 2.9, 2.10, 2.11) rather than by Quality. When recent experience indicates that an established procurement source may be unacceptable, Quality personnel notify Procurement of the potential advisability of changing suppliers and follow up to assure that appropriate corrective action is taken. Quality assurance personnel participate in the selection of procurement sources by conducting selected pre-award surveys and audits as described in Q. D. 8.1.

5.3 PROCUREMENT DOCUMENTS

5.3.1 REVIEW

Procurement documents (purchase requisitions) are reviewed by Quality, by implementation of Q. D. 8.1. Quality Engineering reviews of purchase requisitions are documented only to the extent indicated on the purchase requisition or its attachments. All quality requirements listed on the purchase requisition require incorporation on the purchase order. Purchase orders when issued are compared to originating requisitions by Quality to assure that original quality requirements are maintained and are sufficient. Supplier selection is conducted as described in paragraph 5.2 above.

5.3.2 CONTENTS

Detailed quality requirements are included as part of the purchase order as deemed necessary by Teledyne Energy Systems** (refer to Notes). Negotiation with sole-source or limited quantity suppliers or suppliers having proprietary processes

occasionally restricts the extent to which these detailed quality requirements can be enforced.

**** NOTES:**

These detailed requirements include:

- (1) **Changes:** The supplier shall be required to notify the contractor of any proposed changes in raw materials, design, fabrication methods, or processes approved by the contractor, including changes which may affect the quality or intended end-use of the item, and obtain written approval of the change from the contractor before making the change. Changed articles require change in identification, on both hardware and software.
- (2) **Purchased Raw Materials:** Purchased raw materials shall be accompanied with chemical and/or physical test characterization results when such characteristics have been established as necessary design requirements.
- (3) **Raw Materials Used in Purchased Articles:** 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 this subcontract or purchase order shall be made available to the contractor upon request.
- (4) **Preservation, Packaging, Packing, and Shipping:** Requirements for preservation, packaging, packing and shipping of articles and materials shall be specified or referenced.
- (5) **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.

- (6) **Traceability and Identification:** Traceability and identification requirements shall be specified.
- (7) **Inspection and Test Characteristics:** Characteristics to be subject to inspections or tests by the supplier shall be specified.
- (8) **Inspection and Test Records:** Inspection and test records to be maintained by the subcontractor to provide evidence of subcontractor inspections and tests shall be clearly specified. Records to be provided to the contractor or his source inspection personnel shall be specified.
- (9) **Resubmission of Nonconforming Articles or Materials:** Nonconforming articles and materials returned to the supplier by the contractor and subsequently re-submitted to the contractor shall bear adequate identification of such resubmission either on the article or material or on supplier records. Reference shall be made to the contractor's nonconformance document and evidence provided that causes for nonconformances have been corrected and actions taken to preclude recurrence.
- (10) **Contractor Quality Assurance Activity at Source:** When contractor quality assurance activity is required at source, the procurement document shall so indicate.
- (11) **Procurements Specifying Government Source Inspection (GSI):** When GSI is specified in the procurement document, the following or similar statement shall be included:

"The Government reserves the right to inspect any or all work on this order at any time and place. If the Government elects to perform surveys, inspections, and/or analyses, the supplier will be notified through appropriate contractor channels of communication."

The Government representative shall be notified in a timely manner of impending inspections or tests on articles or materials, when such inspection has been specified.

- (12) Procurements other than those requiring GSI: When GSI is not required on a procurement, the following statement shall be included:

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

- (13) Equipment Records: Detailed requirements for equipment records shall be specified.

- (14) Parts and Processes Involving Proprietary Information: It is the policy of DOE to minimize the usage of parts or processes involving proprietary information for qualification or end-item hardware. However, in the event that circumstances require the use of proprietary items, proprietary interests shall not deter the DOE Program from obtaining detailed knowledge and understanding of designs and processes which are fundamentally necessary for the required high level technical performance of DOE parts, components, and systems.

(FMA's cannot be performed on all parts and all processes cannot be controlled without this information.)

A. Proprietary parts and components may be procured only if:

- a. The vendor agrees to reveal to the extent necessary to satisfy paragraph 5.3.2. (14) and the subsequent provisions, his design and design analysis through some medium such as a protective agreement, or
- b. The vendor agrees to reveal his Failure Mode Analysis which must be of the same level or can be carried to the same level of detail and technical quality as contractor FMA's, and
- c. The contractor arranges to review and understand the process and controls it through the vendor quality plan which is part of the procurement package, or
- d. The contractor gains sufficient understanding of the process and the vendor's quality program to be assured that the process is under proper control, or

- e. The contractor arranges to have a resident in-plant, quality monitor who is under protective agreement and who understands the process and controls and properly certifies the in-plant quality program.
- B. Proprietary processes, such as surface finishing, etc., may be procured for any part or component if the procurement action is carried out to satisfy section 5.3.2 (14) c, d, or e.
- C. In the event of vendor non-compliance, the DOE on-site representative will be notified 48 hours prior to finalizing the procurement action.

5.4 CONTRACTOR QUALITY ASSURANCE PERSONNEL AT SOURCE

Teledyne Energy Systems may assign quality assurance personnel at supplier facilities. Personnel shall conduct appropriate quality assurance activities, including inspections, to ensure that the supplier complies with applicable requirements.

Source Inspection shall take place when inspection of critical materials or articles cannot be effectively accomplished at the contractor's facility due to equipment limitations destructive nature of verification tests, poor history of supplier performance, or when other infeasibility of determining quality on a post-shipment basis exists.

5.5 GOVERNMENT SOURCE INSPECTION

Source inspection performed by and for the convenience of the Government on procured articles or materials shall not, in any way, replace Teledyne Energy Systems source inspection or relieve the contractor of his responsibilities for ensuring their quality. The need for delegation of Government Source Inspection will be determined by DOE or its designated Government quality representative.

5.6 RECEIVING INSPECTION

Teledyne Energy Systems shall maintain a receiving inspection system through implementation of Q. D. 's 3.6 and 8.1 which ensures:

- (1) That procured articles and materials indicate evidence of inspections and tests performed by the suppliers in accordance with purchase requirements and are accompanied with required inspection and test data.

- (2) That articles and materials or accompanying records exhibit evidence of contractor and Government Source Inspection, as required.
- (3) That supplier inspection and test data is acceptable by conducting inspections and tests of selected characteristics. As a minimum, receiving inspection and test shall include verification of characteristics and design criteria which have not been source inspected by the contractor and which can be verified without disassembly of the article. Particular emphasis shall be placed on those characteristics for which nonconformances may not be detected during subsequent inspection and test. Inspections and tests shall be accomplished in accordance with established inspection and test procedures.
- (4) That periodic disassembly is accomplished as appropriate for more detailed verification of the specified requirements.
- (5) That traceability and identification requirements have been met and are maintained; that all required data and records are complete and correct; and that articles and materials can be directly related to applicable supplier records.
- (6) That appropriate inspection and test equipment and technical documents are available at the proper places and at the proper times to perform the test and inspections.
- (7) That supplier records for articles and materials having definite characteristics of quality degradation or drift with age and/or use indicate the date and test time or cycle at which useful life was initiated and the life or cycles used. The records shall be maintained and updated if life or cycle use occurs during receiving inspection activities. The receiving inspection system shall also ensure that the articles and materials, when required, exhibit evidence of initiation of useful life, the life or cycles used, and the date and test time or cycle at which useful life will be expended.

- (8) That chemical analyses and physical tests, required by specification or drawing, are performed on test specimens submitted with purchased articles and materials.
- (9) That chemical analyses and physical tests are conducted on samples randomly selected from materials received.
- (10) That the quality status of articles and materials is maintained during receiving inspection and test operations. This shall include physical separation and identification of articles and materials according to the following categories:
 - a. Items awaiting inspection or test results,
 - b. Conforming items, and
 - c. Nonconforming items.
- (11) That articles and materials and their records clearly indicate their acceptance or nonconformance status when released from receiving inspection and test.
- (12) That articles and materials to be released are adequately controlled and protected for subsequent handling, storage or use.

5.7 RECEIVING RECORDS

Receiving inspection and test records shall be maintained for articles and materials in accordance with Q. D. 3.6 to indicate, as a minimum: date of receipt; accomplishment of applicable requirements of para. 5.6 (1) through (12); results of inspection and test procedures utilized; and disposition of the articles or materials. Records shall include copies of pertinent supplier documents received or an indication of the type of documents received and their location.

5.8 COORDINATION OF CONTRACTOR-SUPPLIER INSPECTION AND TESTS

Adherence to the requirements of Q. D. 8.1 and the "Quality Assurance Provisions of Purchase Orders" (NQ-341) will insure proper control. Detail requirements (ASME, ASTM Specification, Etc.,) are incorporated on purchase requisitions and purchase orders as required.

5.9 NONCONFORMING PROCURED ITEMS

Control of purchased items that do not conform to requirements is met by the implementation of Q.D.'s 3.3, 3.6, 3.7 and 8.1. Resubmittals by suppliers are identified where practicable by specification for identification and/or certification on repair purchase orders or by physical marking at TES or by on-site inspection by TES Quality representatives.

5.10 CONTROL OF PROCURED ARTICLES AND MATERIALS

Identification, control, handling and storing of procured items is accomplished by established material handling procedures and implementation of Q.D.'s 3.3, 3.6 and 3.7.

SECTION 6. FABRICATION AND ASSEMBLY

6.1 PLANNING

Manufacturing procedures are planned and conducted in accordance with technical documentation. This is achieved by implementation of manufacturing Process Specifications and Engineering drawings which detail fabrication steps appropriate to the complexity of the manufactured item and by inspection activities implemented by Q. D. 5.5. However, additional written procedures for detailed sequencing and scheduling of separate Manufacturing tasks are not employed because they are not cost effective. Sequencing of operations is indicated in the NOTES (as applicable) of appropriate Engineering drawings and specifications. Additionally, safety assurance monitoring points are not incorporated into Quality procedures per se but are handled as cautions within appropriate specifications and where required as safety documents complete unto themselves.

6.2 ARTICLE AND MATERIAL CONTROLS

Articles and materials subjected to fabrication, processing, or assembly operations shall be identified and controlled throughout fabrication operations in accordance with specifications, drawings, or other technical documents. Identification shall be indicated either on the article or material or on related records.

6.3 FABRICATION AND ASSEMBLY PROCESSES

Process and fabrication controls are achieved by the use of Process Specifications, implementation of Q. D. 5.5, shop folders, production travelers, Product flow charts (OCAR and Page and Line Schedules) and special instructions, as appropriate. Process flow charts will not be utilized since lot sizes of articles produced do not lend themselves to analysis as continuous or repetitive functions. Tooling items are not necessarily identified in planning documents, and although they are inspected prior to initial use, they are not necessarily inspected at prescribed intervals but rather when non-conformance is suspected, at which time appropriate corrective action is taken. Tooling items which are used as a basis for product acceptance are identified and are inspected periodically.

6.4 PROCESS QUALIFICATION

For processes where uniform, high quality cannot be insured by inspection and test of end items alone, process qualification at Teledyne Energy Systems consists of diligent document review according to Q.D. 2.2 and greater than normal inspection of process steps and first article of manufacture. These processes will be maintained on a Qualification Listing indicating the qualification status (first manufactured article may be a production item in which case the on-site DOE representative will be notified 48 hours prior to implementation). Required Government inspection points will be included in Manufacturing flow charts (OSCAR) and schedules (Page and Line Schedules). Processes which could damage or destroy major deliverable assemblies will be rehearsed under DOE surveillance.

6.5 CLEANLINESS AND CONTAMINATION CONTROL

Design requirements through appropriate technical documentation (Process Specifications and Engineering drawings) provide for necessary cleanliness of materials, precision parts, components, assemblies and systems. General housekeeping is audited according to Q.D. 5.3.

6.6 COMPLETED END ITEMS

Appropriate end item inspection prior to delivery is called out in design documentation.

6.6.1 MODIFICATION, REPAIRS OR REPLACEMENTS

Same as 6.6. In addition, any replacements accomplished after customer acceptance are accounted for on the Replacement Record which is part of the end item Data Package. Reinspection and retesting is performed as required and as specified in any associated non-conformance reports.

6.7 WORKMANSHIP STANDARDS

Quality Engineering when necessary will establish physical workmanship standards in joint review with representatives of DOE. These standards will be maintained by Quality Control and will be subject to periodic auditing at the discretion of Quality Engineering.

SECTION 7. INSPECTIONS AND TESTS

7.1 INSPECTION AND TEST PLANNING

The necessary detailed planning of inspection and test activities is assured by implementation of Q. D. 5.5. Non-destructive testing or inspection of components will be accomplished by adherence to the Non-destructive Test Plan included as Appendix II of this document. Safety assurance monitoring points as required will be included in appropriate Engineering specifications and drawings.

7.2 INSPECTIONS AND TESTS

7.2.1 GENERAL REQUIREMENTS

Throughout the manufacturing cycle Teledyne Energy Systems shall perform or have performed inspections and tests in accordance with established plans, instructions, and procedures (Q. D.'s 3.3, 3.4, 3.7, 5.5, 7.1 and 10.1). Teledyne Energy Systems shall verify that inspection and test prerequisites are met, that appropriate instruments and devices are used, and that inspections and tests are performed in the proper sequence under suitable environmental conditions. Quality shall establish, implement, and maintain procedures to detect, analyze, and record any non-conformances and to assure that appropriate corrective action is taken and completed. Quality shall also assure that results of inspections and tests are recorded and can be traced to responsible fabrication, processing, inspection and test personnel.

Quality shall assure that inspection stations are located at appropriate points during the fabrication, processing, assembly, storage and shipping operations so that parts, components, and assemblies are inspected and tested and data recorded in accordance with documented criteria.

Teledyne Energy Systems shall furnish inspection and test results and related data to the Government on request.

7.2.2 DOCUMENTATION

Quality by implementation of Q.D. 5.5 shall provide procedures, instructions, and check lists that clearly describe the appropriate inspections and tests for materials, work in process, and completed articles as required by the standard, specification, and the Contract. In addition, the criteria for acceptance or rejection of product shall be included. All characteristics required to be reported by the standard, specification, or Contract shall be examined as prescribed by procedures and instructions and the results recorded on check lists or other documents appropriate to the inspection or test.

Instructions and procedures shall be revised and updated as required to reflect design or contract changes.

7.2.3 RECORDS

Inspection, test and other data related to the status of parts, components, assemblies, and systems shall be collected, processed, analyzed and distributed to pertinent areas within the contractor's organization. Examples of records include acceptance test data, inspection and test reports, material certifications, welder qualifications, quality audit reports, summaries of non-conformances, MRB actions, and corrective actions.

7.2.4 INSPECTION AND TEST OF MAJOR DELIVERABLE SYSTEMS

Separate inspection and test specifications and procedures shall be prepared and utilized for designated major deliverable systems. These inspections and tests shall be conducted in a manner and under conditions which simulate end use and environments to the highest degree practical without damage to them, and which provide a valid measure of the overall quality. The degree, duration, and number of tests performed on each system shall be sufficient to provide assurance that it is capable of meeting contract requirements, and that the required quality and workmanship is present.

Inspection or test procedures for deliverable systems that could damage or destroy them shall be reviewed by Engineering, Test and Quality personnel with appropriate expertise. Actual rehearsal of the procedures will not be performed or audited by

Quality except in those instances where such requirements are deemed not necessary by TES or DOE.

7.2.5 CONTRACTOR QUALITY ASSURANCE ACTIONS

Prior to testing, quality assurance personnel shall by implementation of Q. D. 's 3.3, 3.4, 5.5 and 6.2:

- a. Verify that applicable inspection and test documents are complete, unambiguous and available.
- b. Ensure that requirements for selection and control of articles have been implemented and that test constraints have been resolved.
- c. Verify that articles are identified.
- d. Verify configuration of articles.
- e. Verify that configuration of GSE is consistent with articles under test.
- f. Verify that test equipment is calibrated and such calibration will be effective and sustained during the test period.

During testing, quality assurance personnel shall:

- a. Ensure that testing is accomplished in accordance with test specifications and procedures.
- b. Ensure accurate and complete recording of data and test results.
- c. Document rework, repair or modification occurring during the test operation.
- d. Document non-conformances and participate in their dispositions.

Subsequent to testing, quality assurance personnel shall:

- a. Ensure proper disposition of articles.
- b. Report any additional non-conformances and participate in their dispositions.
- c. Ensure that remedial and preventive action has been accomplished relative to nonconformances.
- d. Verify that test results and reports are accurate, complete, and traceable to the tested articles.

SECTION 8. NONCONFORMING ARTICLES AND MATERIALS

8.1 CONTROLS

Quality shall implement Q.D.'s 3.3, 3.4, 3.5, 3.6, 3.7 and 5.5 for control of parts, materials, components, systems, and processes that do not conform to requirements of the applicable design drawings, codes, standards, specifications, or other contractual documents. The Q.D.'s noted shall provide for the prompt detection, recording, verification, corrective action and disposition of nonconforming items. Quality shall identify and segregate all nonconforming items to prevent their unauthorized use or shipment. Hold areas shall be provided for storage of nonconforming items. Quality shall maintain records of all nonconformances and the corrective actions taken, and the records shall provide data for analysis and reference. Accept (use-as-is), repair, scrap, conditional release (as noted in Q.D. 3.7, para. 3.2), return for rework at completion of operations, return to supplier, or retest of nonconforming items shall be accomplished in accordance with documented procedures and instructions. Articles fabricated by a nonconforming process shall be deemed nonconforming.

8.2 INITIAL REVIEW DISPOSITIONS

Nonconforming articles and materials shall be reviewed initially by personnel per Q.D.'s 3.3, 3.4 and 3.7 and shall be subjected to one of the following dispositions: return for rework or completion of operations; scrap, return to supplier; release for continued fabrication pending receipt of missing documentation; submit to Corrective Action Board (CAB).

8.3 MATERIAL REVIEW BOARD (as defined in Q.D. 3.7)

8.3.1 MEMBERSHIP

A Corrective Action Board (CAB), defined in Q.D. 3.7, has been instituted at Teledyne Energy Systems, whose activities include the functions of a Material Review Board (MRB). Board membership is limited to Teledyne Energy Systems personnel representing Engineering, Reliability and Quality and the on-site DOE representative. Program management per operations directive will designate by name the board members and their alternates, subject to DOE approval.

8.3.2 RESPONSIBILITY

The Corrective Action Board shall (in accordance with Q.D. 3.7):

- a. Determine disposition of submitted articles or materials designated as nonconforming.
- b. Ensure that effective corrective actions are documented on the nonconformance document prior to disposition.
- c. Provide contractor recommendations to the on-site DOE representative concerning nonconformance dispositions requiring his approval and verify implementation after approval is obtained. Information copies of Class I nonconformances will be submitted to the on-site DOE representative.
- d. Ensure that accurate records of MRB actions are maintained.

8.3.3 MRB DISPOSITIONS

Dispositions by the Corrective Action Board are defined within Q.D. 3.7 with the exception of those referred to the FRB. It should be noted that the CAB recognizes a disposition entitled, "restricted usage" as defined in Q.D. 3.7. Nonconformances forwarded for CAB review will be categorized as Class I or Class II. This designation will be indicated directly on the CAB report and will be defined as follows:

"Nonconformances which adversely affect safety, function, reliability, interchangeability, or interface characteristics or which do not comply with contractually referenced or approved documents shall be referred to the DOE Program Manager with a recommended disposition and corrective action and be considered Class I. All others will be Class II."

A Failure Review Board (FRB) has been instituted at Teledyne Energy Systems which will function at the management level to review all nonconformances referred to it by the CAB. The mechanism and administration of the FRB are detailed in Appendix IV of this Quality Plan.

8.4 NONCONFORMANCE REPORTING AND CORRECTIVE ACTION

8.4.1 NONCONFORMANCE REPORTING

Quality shall, utilizing Q.D.'s 3.3, 3.4, 3.6 and 3.7, report, verify, analyze, and correct nonconformances. These procedures shall provide assurance that the cause and mode of each nonconformance is determined, that potential safety and availability implications are evaluated, nonconforming items are properly dispositioned, and that corrective action is taken.

A report shall be prepared to identify the nonconforming item and its origin or source of manufacture and shall describe the nonconformance, the status, the probable cause, the disposition of the item, and the recommended corrective action. A periodic correction action status report as defined in Q.D. 3.7 shall be issued by Quality Engineering.

8.4.2 CORRECTIVE ACTION

Prompt detection and correction of all nonconformance is accomplished by Q.D.'s 3.3, 3.4, 3.6 and 3.7. TES will conduct appropriate analyses and examinations for determining the root cause of a nonconformance and for initiating necessary improvements and corrections to preclude repetition of the nonconformance. Although the corrective action system extends to the performance of subcontractors and suppliers, extension of the corrective action system to participating contractors is a function of interface agreements in effect during the contractual period.

8.4.3 QUALITY TREND VISIBILITY

Quality Engineering will periodically issue a Corrective Action Status Report which will list current nonconformances and the status of proposed corrective actions. A statistical analysis will not be provided. Quality trend summaries, when appropriate, will be reported as part of the Monthly Quality Status Report.

SECTION 9. CALIBRATION AND STANDARDS

9.1 GENERAL

General procurement practices and the implementation of Q. D. 's 7.1 and 8.1 provide for the selection, acquisition, calibration, adjustment, maintenance and control of inspection, measuring and test equipment.

9.2 EQUIPMENT EVALUATION

Special equipment, (e. g. , automatic test and checkout equipment) is handled and processed in a manner identical with that of standard equipment as described in Q. D. 7.1.

9.3 EQUIPMENT CONTROL

Teledyne Energy Systems through implementation of Q. D. 7.1 provides for the calibration of inspection, measuring and test equipment. However, Teledyne Energy Systems employs special leak test calibration equipment provided by a participating contractor that are not traceable to national standards.

9.4 CALIBRATION STANDARDS

Teledyne Energy Systems through implementation of Q. D. 7.1 or use of an approved standards laboratory provides for the calibration and traceability of Teledyne Energy Systems standards to national standards except as noted in 9.3.

9.5 DISCREPANT EQUIPMENT

When discrepancies in inspection, measuring and test equipment are found at calibration, Quality through usage of Q. D. 's 3.3, 3.7 and 7.1 determines what corrective action is required and the resultant disposition of the discrepant equipment, and any impacted material, component or system.

SECTION 10. STAMPS

10.1 STAMP CONTROL SYSTEM

Teledyne Energy Systems through Q.D. 10.1 will establish and maintain a documented stamp control system which provides for the following:

- a. Stamps, decals, seals, torque wax, paints, signatures, etc., shall identify that articles and materials have undergone source and receiving inspection, in-process fabrication and inspection and end-item fabrication and inspection, end-item testing, storage, and shipment.
- b. Stamps shall be traceable to each individual responsible for their use and records shall be maintained to identify individuals with specific stamps. Fabrication and inspection stamps shall be of different design.
- c. Stamps shall be applied to records to indicate the fabrication or inspection status of associated articles and materials.
- d. Stamps shall be applied to tags, cards, or labels attached to individual articles and materials or their containers, as appropriate.
- e. Stamps indicating that fabrication, inspection or test operations have been performed may be applied directly to articles and materials except when this is impractical due to physical limitations of the article or such applications will compromise their quality.
- f. Stamping methods and marking materials must be compatible with the articles and their use.

10.2 STAMP RESTRICTION

Teledyne Energy Systems' stamps do not contain the designation "DOE," as restricted by QD 10.1 and flight and flight-type hardware shall not be stamped.

SECTION 11. HANDLING, PRESERVATION, PACKAGING, STORAGE, SHIPPING

11.1 HANDLING

Special handling requirements are included as part of drawings or other technical documentation. Current handling techniques of Manufacturing evolved during extensive experience with RTG's and associated hardware provide adequate definition, description and direction.

11.2 PRESERVATION, PACKAGING AND STORAGE

Implementing the preservation, packaging and storage instructions and procedures defined on engineering drawings and specifications provides preservation, packaging and storage definition, description and direction. TES shall assure that items subject to deterioration or damage through exposure to air, moisture, or other environments during fabrication, processing, assembly, and interim storage periods are appropriately protected to preclude damage. Items being packaged for shipment shall be protected in accordance with contract requirements. Items subject to damage shall be packaged in such a manner, and with such materials, as required to prevent damage. Packaging requirements shall allow for conditions that could affect the item at the contractor's plant, in transit to the destination, and at the destination. Items to be stored shall be adequately protected against deterioration and damage.

11.3 SHIPPING

Implementation of shipping instructions and procedures defined on engineering drawings and specifications and implementation of Q.D. 5.5 provides definition, description and direction for proper shipping. TES shall provide for inspection and control of all items shipped from its plant to assure that: (1) items to be shipped have received and satisfactorily

passed the required inspections and tests, (2) items have been protected and packaged in accordance with applicable specifications and procedures, (3) items and packaging have been properly identified, and (4) devices to record or monitor conditions during shipping and future storage have been provided as appropriate, and (5) shipments handling and packaging involving radioactive material meet applicable safety and safeguard requirements.

SECTION 12. STATISTICAL QUALITY CONTROL AND ANALYSIS**12.1 GENERAL**

Quality Engineering will employ statistical methods for analysis when required and will implement sampling plans as contained in QD 4.1 as necessary. Sampling plans other than those contained in QD 4.1 will be submitted to DOE for approval prior to implementation.

12.2 CRITICAL PARTS, MATERIALS AND PROCESSES

Quality will, dependent on part criticality, subject samples of material to destructive test for assurance of product quality at a cost-effective level.

APPENDIX A. DATA PACKAGE

APPENDIX A: DATA PACKAGE

Delivered end items which are subject to acceptance by NRA are to be accompanied by a Data Package. The Data Package is considered as a deliverable end item and, as such, in itself, subject to Quality Assurance acceptance by NRA or its designee.

Data Package Content

As a minimum, Data Packages will include the following sections:

Section 1 - Title Page

The title page will contain the equipment item name, drawing number, revision letter, serial number and the contractor's approval signature for the Data Package.

Section 2 - DD-250

This section will contain a copy of the applicable DD-250 record (Material Inspection and Receiving Report).

Section 3 - Operating Log

This section will contain a chronological historical record of the equipment, hardware or system. The actual time that the equipment, hardware or system was functionally operational during each specific test, etc., shall be denoted as well as the total cumulative operating time to date. Such entries shall be dated and signed by authorized contractor personnel.

Section 4 - Product Definition

This section will contain the following record(s):

Configuration Definition Record

The Configuration Definition Record will be in tabular form. It will contain a listing of the drawing numbers of all special design items which are contained in the List of Materials of the top drawing for which the equipment Data Package is prepared. This table shall also indicate all authorized engineering changes which apply to the equipment and the list of special design items. Entries on this table shall be verified and such verification shall be designated by an authorized contractor's signature.

Record of Assembly

The Record of Assembly will be in tabular form. It will contain a listing of the drawing numbers of all special design items which are contained in the List of Materials of the top drawing for which the equipment Data Package is prepared.

The actual "as built" configuration of the equipment will be documented by recording or verifying parts numbers, parts serial numbers and/or lot, batch, etc., numbers for all above mentioned special design items. Entries on this table shall be verified by the contractor, by observation of the assembly operation, and such verification shall be designated by a formal inspection stamp. At the contractor's option, the Configuration Definition Record and the Record of Assembly may be integrated into a single record provided that all requirements are observed.

NOTE: The Record of Assembly will contain a complete listing of nonconformance reports to the lowest level of assembly which is represented in this section.

Section 5 - Subassembly Configuration Record

The subassemblies that require product definition (as in Section 4) will be mutually agreed upon between the Contractor and the Government Representative. Section 5 may be combined with Section 4.

NOTE: The subassembly configuration record will contain a complete listing of nonconformance reports to the lowest level of assembly which is represented in this section.

Section 6 - Replacement Records

Components or subassemblies in an end item may require replacement after original acceptance of the end item. If this occurs, a replacement record shall be made showing nomenclature and identification of both old (replaced) and new (replacement) components or subassemblies, with the date of and reason for the replacement. An updated (new or corrected) Product Definition Record is also entered, and the obsolete record (unless corrected) is removed from Section 4 or 5, as appropriate.

Section 7 - Weight and Balance

This section will contain the equipment weight and balance data. Entries in this section shall be verified by the contractor and such verification shall be designated by a formal inspection stamp or contractor's signature. This section is not applicable to GSE.

Section 8 - Qualification and Acceptance Test Data

This section shall include applicable qualification or acceptance test data. It shall include both test procedures and the resulting test data.

Section 9 - Certificates of Inspection

This section will contain copies of all Certificates of Inspection (the document used by NRA to accept items from a contractor) which were executed in support of the equipment and its various subparts and which have resulted in the "Accept" or "Qualified Accept" lot disposition category.

This section will also contain copies of all Certificates of Inspection which were executed in support of the equipment and its various subparts and which have resulted in the "Conditional Acceptance" category, provided that the equipment is to be shipped in the "Conditional Acceptance" category.

Section 10 - Nonconformance Reports

This section will contain copies of all nonconformance reports which were executed during inspection and processing of the equipment and its various subparts.

Section 11 - Drawings and Specifications

This section will contain a copy of the top level and first tier assembly drawings and specifications for the product. If a separate handling, packaging or shipping drawing or specification exists, it will be included.

Section 12

This section will contain the applicable operations/maintenance manual.

General

The Data Package will be assembled in a bound configuration insofar as is practical. Those records which do not readily lend themselves to a bound configuration may be assembled in a separate package which must be adequately associated with the bound Data Package.

The contents of the Data Package are in all cases to be original records or good quality copies of original records. Due regard shall be given to Data Package completeness and arrangement of records.

APPENDIX I

QUALITY DIRECTIVES & PROCEDURES

QUALITY DIRECTIVE

TITLE: REVIEW OF TECHNICAL DOCUMENTS		
ORIGINATED BY: A. M. Konjura	DIRECTIVE NO. 2.2	REV. B
REVISED BY: A. M. Konjura	REVISION DATE 5/1/72	
REVIEWED BY: <i>RP Burns</i>	ORIGINAL ISSUE DATE 9/18/70	
APPROVED: <i>J. J. Hood</i>	PAGE 1 OF 5	

1. SCOPE

1.1 Summary

This directive delineates the methods to be used by Quality Engineering for reviewing and approving drawings, specifications, procedures and other required technical documents.

1.2 Purpose

To insure that technical documents comply with contractual requirements and specify a quality product.

1.3 Reference

- a. Quality Procedure 2.0, "Drawings and Specifications"
- b. Quality Procedure 5.0, "Quality Engineering"

2.0 RESPONSIBILITIES

2.1 Quality Engineering

Quality Engineering shall review drawings, procedures and other technical documents.

2.2 Program Management

Program management shall implement a technical document release system explicitly requiring Quality Engineering approval before release. A list of those technical documents to receive a Quality Engineering review shall be specified in a Product Definition Plan or other contractual documentation.

3. REQUIREMENTS

3.1 Review of Technical Documents

All new or revised technical documents shall be reviewed before release. Previously released technical documents which have not been signed off by Quality Engineering may be reviewed but will require additional documentation to effect changes or corrections (see Paragraph 3.1.5 below).

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- 3.1.1** Technical Document Review Criteria - The technical document review by Quality shall encompass, as appropriate, the items listed below.
- a. Clarity, completeness and lack of ambiguity.
 - b. Compatibility with fabrication, assembly, test and inspection requirements and capabilities.
 - c. Compliance with contractual specifications.
 - d. Proper and complete identification of materials, processes, non-destructive tests, etc.
 - e. Clear and specific definition of acceptance criteria.
 - f. Any additional appropriate quality aspects.
- 3.1.2** Acceptable Documents - Technical documents which are reviewed and found to be acceptable will be signed off by the cognizant Quality Engineer after all other departmental review changes, if any, have been incorporated.
- 3.1.3** Changes and Corrections - Items which require changes or corrections will be submitted to and discussed with the originator as required to accomplish corrections.
- 3.1.4** Critical Corrections - When review of technical documents exposes items considered to be of a major or critical nature that might extend beyond the realm of the document being reviewed, a Liaison Call Sheet, Form 060572 (Figure 1), will be used to document the problem and assure appropriate action.
- 3.1.5** Previously Released Technical Documents - A Liaison Call Sheet will be used to document and assure resolution of points on previously released documents.
- 3.2** Documentation
- Technical document reviews and resulting changes shall be documented on the Document Review Log, NSD 47 (Figure 2), and the Liaison Call Sheet (Figure 1), as required.
- 3.2.1** Document Review Log - A record of the documents reviewed by Quality Engineering will be maintained in the Document Review Log (Figure 2).
- 3.2.1.1** Entries in the Log will be made at the time of the initial review of a document and will indicate the date of receipt. Changes and LCS action will also be noted, as required.

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- 3.2.1.2 The approval date and signature will be entered only when the document has been signed off by Quality Engineering.
- 3.2.1.3 Later changes or change notices reviewed are to be noted in the next lower blocks.
- 3.2.2 Liaison Call Sheet - Documentation of changes to released documents and critical corrections shall be accomplished by use of the Liaison Call Sheet (LCS).
- 3.2.2.1 The Quality Engineer originating the LCS will complete all applicable blocks and forward the white original and the pink copy to Engineering or Manufacturing, as required, for action.
- 3.2.2.2 LCS's generated by Quality will be maintained in numerical order in the Liaison Call Book.
- 3.2.2.3 Initially the green copy of the LCS is filed in the Liaison Call Book while resolution is being accomplished. Upon receipt of the original with acceptable resultant action noted, the green copy is replaced by the white original as the permanent file copy.

4. APPENDIX

4.1 Figures

Figure 1 - Liaison Call Sheet, Form 060572

Figure 2 - Document Review Log, NSD 47 (10/71)

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DOCUMENT REVIEW LCG					PROGRAM _____			
					DOCUMENT SERIES _____			
DWG #	DOCUMENT TITLE	REV.	REVIEW BY	Date	ACTION CODE	LCS #	APPR. DATE	APPROVED BY
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								

NSD- 47 (10/71)

ACTION CODE	F - Note Missing or Incorrect
A - As Consent	G - Materials Incorrect or Missing
B - Minor Errors	H - Test Requirements
C - Dimensional Errors	I - Mfg. Process Incorrect/Missing
D - Extensive (Major) Errors	J - Non Conformance to Spec.
E - Design Change Requested	

Figure 2



QUALITY DIRECTIVE

TITLE: TELEDYNE ISOTOPES REPORTING SYSTEM		
ORIGINATED BY: W. Rowe	DIRECTIVE NO. 3.3	REV. B
REVISED BY: A. M. Konjura	REVISION DATE 5/1/72	
REVIEWED BY: <i>R.P. Brand</i>	ORIGINAL ISSUE DATE 5/21/69	
APPROVED: <i>L. J. Hood</i>	PAGE 1 OF 5	

1. SCOPE

1.1 Summary

This directive provides the requirements to be met in completing the Teledyne Isotopes Reporting System Tag, Form No. NSD-16 (5-71).

1.2 Purpose

To define required documentation for reporting nonconforming items.

1.3 References

- a. Quality Procedure 3.0, "Material Control"
- b. Quality Procedure 6.0, "Data and Reports"

2. RESPONSIBILITIES

2.1 All Departments

Report incidences of nonconformance by completing the section of the Reporting System (RS) Tag which is enclosed within the heavy black border (Section "A" of Fig. 1) and forwarding the tag to Quality Control.

2.2 Quality Control

Quality Control will be responsible for verifying the proper completion of section "A" of the Reporting System Tag. Upon completion of Section "A," Quality Control will forward the RS tag to Quality Engineering.

2.3 Quality Engineering

Quality Engineering will be responsible for the proper completion of the section of the Reporting System tag which is not enclosed by the heavy black border (Section "B" of Fig. 1). Upon completion of the RS tag, Quality Engineering will distribute copies and file the master.

Q. D. 3.3 B
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3. REQUIREMENTS

3.1 Individuals Responsible for Completion of the RS Tag

3.1.1 Initiator - The individual initiating the RS tag will complete all items in Section "A" of the RS tag with the exception of the following:

- a. Quality Supervisor's signature
- b. Quality Manager's signature
- c. Acknowledgement signature

3.1.2 Quality Control Supervisor - The Quality Control Supervisor will be responsible for obtaining the signatures noted in 3.1.1 above and for forwarding the RS tag to Quality Engineering for disposition.

3.1.3 Quality Engineering - Quality Engineering will be responsible for completing Section "B" of the RS tag, including obtaining the Quality Manager's signature for approval of the final disposition.

3.2 Data Required for Completion of the RS Tag

3.2.1 Type of Data - The type of data required to complete the RS tag is explained by the block headings on the tag and/or the instructions on the reverse side of the hard copy of the RS tag. The following four block headings may require further clarification.

3.2.1.1 "Initial Rpt. No." is used to show the serial number of existing RS tags against the item currently being rejected and directly related to the discrepancy in question.

3.2.1.2 "Item" is used to differentiate between different types of defects when an RS tag is used to record rejections for more than one reason. Each rejection reason should have a different item number and should be correlated with part serial numbers in the "Description of Event" section of the tag.

3.2.1.3 "Total Qty." is used to represent the total number of parts in the inspection lot.

3.2.1.4 "Qty. Defect" is used to represent the total number of defective parts.

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3.3 Supplementary Forms

3.3.1 RS Supplemental Page, Form No. NSD-15 (5-71) - The RS Supplemental Page (Fig 2) will be used as a continuation sheet for data which cannot be included on the face of the RS tag because of length.

3.3.2 Corrective Action Board Report, Form No. NSD-13 (5-71) - A Corrective Action Board Report (Fig. 3) will supplement the RS tag when the final disposition of a nonconformance is made by the Corrective Action Board rather than Quality Engineering.

4. NOTES/APPENDIX

4.1 Figures

Figure 1 - Teledyne Isotopes Reporting System Tag, Form No. NSD-16 (5-71)

Figure 2 - Teledyne Isotopes Reporting System Supplemental Page,
Form No. NSD-15 (5-71)

Figure 3 - Teledyne Isotopes Corrective Action Board Report,
Form No. NSD-13 (5-71)

S/N 6426

PROGRAM		ACC. USE NO.	MANUFACTURER	DATE	REORDER LIST NO.
ITEM PART NO.		ITEM S/N	ITEM NAME	P.O. NO.	
NEXT ASSY PART NO.		NEXT ASSY S/N	NEXT ASSY NAME	CRITICAL WPY NO.	
TREAT	TOTAL QTY	QTY DEFECT	DESCRIPTION OF EVENT		
			W // A		
ACKNOWLEDGMENT					
QUALITY DEPARTMENT DISPOSITION INSTRUCTIONS				REPORTED BY	DATE
				QUALITY SUPERVISOR	
				QUALITY MANAGER	
				W // B	
				DISPOSITION APPROVAL	DATE
				QUALITY ENGINEER	
				QUALITY MANAGER	

INSTRUCTIONS FOR COMPLETING THIS FORM AND FINAL ACCEPTANCE BLOCKS ON REVERSE SIDE OF HARD BACK COPY. KSD-16 (5-71)

QUALITY ENGINEERING

Fig. 1. Teledyne Isotopes Reporting System Tag

<p>TELEDYNE ISOTOPES REPORTING SYSTEM</p>	RS NO. _____
	SUPPLEMENTAL PAGE _____ OF _____
	PART NUMBER _____
<p>_____ QUALITY ENGINEER-DATE</p>	
<p>DATA & SKETCH TO BE CLEAR AND COMPLETE INSTRUCTIONS FOR COMPLETING THIS FORM ON REVERSE SIDE</p>	

KSD-15 (5-71)

Fig. 2. Teledyne Isotopes Reporting System Supplemental Page

**TELEDYNE
ISOTOPES**

CORRECTIVE ACTION BOARD REPORT

RS NO. _____

PART NO. _____

PAGE _____ OF _____

CAB DISPOSITION APPROVAL		DATE
DESIGN ENGINEER	_____	
RELIABILITY ENGINEER	_____	
QUALITY ENGINEER	_____	
CUSTOMER	_____	

NSD-13 (5-71) INSTRUCTIONS FOR THE PREPARATION OF THIS FORM ON REVERSE SIDE.

Fig. 3. Teledyne Isotopes Corrective Action Board Report.

TITLE: QUALITY CONTROL OF ENERGY SYSTEMS DIVISION FABRICATION MATERIAL		
ORIGINATED BY: A. M. Kestura	DIRECTIVE NO. 3.4	REV. C
REVISED BY: L. Siegrist	REVISION DATE 9/5/74	
REVIEWED BY: W. R. Lutton	ORIGINAL ISSUE DATE 6/4/71	
APPROVED: A. C. McDonald	PAGE 1 OF 9	

1. SCOPE

1.1 Summary

This directive provides guidelines for the flow and Quality documentation of conforming and non-conforming hardware fabricated, processed and tested in-house.

1.2 Purpose

The proper execution of this directive assures the complete quality control of production material as required by contract and standard Quality practice.

1.3 Reference

- a. Quality Procedure 3.0, "Material Control"
- b. Quality Procedure 5.0, "Quality Engineering"

2. RESPONSIBILITIES

2.1 Quality Engineering

Quality Engineering shall prepare inspection instructions, evaluate defects, failures and other anomalies, and disposition material in accordance with procedures herein prescribed or which are contractually required.

2.2 Quality Control

Quality Control shall inspect to drawings, specifications, or specific instructions, and shall document actions, and carry out the disposition of material as directed below.

3. REQUIREMENTS

3.1 Quality Control Action

Quality Control personnel shall inspect and document all material in accordance with the requirements of this directive.

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- 3.1 make a determination of conformance or non-conformance. All items inspected will be identified and documented as required and defined herein.
- 3.1.1 Conforming Hardware - Conforming parts and assemblies shall be documented as follows:
- 3.1.1.1 Upon completion of inspection of hardware the inspector shall clear the Manufacturing Order by placing his "inspection stamp in the "Final" block of the Manufacturing Order (Figure 1). The date should be entered, and the number of acceptable parts entered in the "Accept" block.
- 3.1.1.2 When operations listed on the Manufacturing Order (M.O.) are completed and parts are acceptable, the inspector shall initiate a Material Acceptance Tag (Figure 2), stamp and attach or place completed tag with parts.
- 3.1.1.3 File the 3rd, or green copy of the completed M.O. by part number in the Quality Control File.
- 3.1.1.4 When additional operations are required by the "M.O." or engineering drawing after an inspection such as: Cleaning, Bake out, leak test etc.; the details of the completed inspections will be briefly described in the "General Notes" section of the "M.O." followed by the inspector's stamp.
- 3.1.1.5 When subsequent operations as described in 3.1.1.4 are to be performed after an inspection, the top half of the Material Acceptance Tag (Figure 3) shall be initiated by the inspector and stamped under the "Q.C." in the top part of the tag only.
- 3.1.1.6 Upon successful completion of the subsequent operations required to complete the "M.O.", the inspector shall stamp the appropriate "Q.C." block (s) in the bottom portion of the Material Acceptance Tag (Figure 3) and complete the M.O. per 3.1.1.1 and 3.1.1.3.
- 3.1.1.7 When inspecting a part which has a Quality Log, clear the Quality Log by Stamping and dating the completed, acceptable operations. Stamped Acceptance Tags for all parts and subassemblies are to be posted in the Quality Log for each major assembly or end item at the time of the appropriate assembly inspection. Include in the Quality Log any required variables data.
- 3.1.1.8 Forward "Incomplete" Quality Logs with the parts to Material Control for subsequent operations.

Q.D. 3.4 C

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- 3.1.1.9 When final inspection and acceptance is completed, check the Quality Log and shop folder for verification of completion of all operations, inspections and tests. Forward the complete Quality Log package to Quality Engineering for review and retention.
- 3.1.1.10 When the item is a completed part, subject to customer acceptance by contract requirement, submit the part to the Customer Representative for his review. Upon his acceptance, obtain customer stamp on the Acceptance Tag and the customer's signature on other documentation required by contract.
- 3.1.2 Non-Conforming Hardware - Parts or assemblies which are found during inspection to be defective or non-conforming shall be processed in a manner which will provide acceptable documentation of the occurrence and removal of the non-conforming item from acceptable production material.
- 3.1.2.1 Non-conforming parts require the initiation of a Reporting System (RS) Tag, N&D-13 (Figure 4). The inspector shall complete the top half of the RS Tag, defining the part and the non-conformance, and:
- a. Obtain the Quality Control Supervisor's signature.
 - b. The Quality Control Supervisor will obtain the Quality Manager's signature.
 - c. The Quality Control Supervisor will then obtain the Manufacturing Manager's (or his representative) signature in the Acknowledgment block and give him the goldenrod copy of the RS Tag.
 - d. The white and green copies are to be forwarded to Quality Engineering for evaluation of the non-conformance and disposition of the item(s).
 - e. Attach to or place the hardback copy of the RS Tag with the questionable part or assembly and put them in the Quality Withholding Area to await resolution by Quality Engineering and further disposition instructions.
 - f. Carry out disposition instructions upon receipt of a completed, approved copy of the RS Tag. In the case of SCRAP items, Quality Engineering will handle the parts in accordance with Q.D. 3.5.

Q.D. 3.4 C

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- 3.1.2.1 g. When disposition has been completed to "Repair" or "Use as is" and the item is accepted, process per Paragraph 3.1.1 and stamp the back of the hardback copy of the RS Tag. Obtain the Customer Representative' stamp, when required, in the space provided, date the Tag and forward it to Quality Engineering.

3.2 Quality Engineering Action

Quality Engineering personnel shall receive all RS Tags, review discrepancies, determine cause, propose corrective action and make an initial disposition (Rework/Scrap/Refer to Corrective Action Board). The RS Supplement Form, NSD-15 (Figure 5), may be utilized for documenting cause and suggested corrective action.

- 3.2.1 Rework - When rework action will correct the defect, detail the method of rework and process the RS Tag as follows:

- a. Complete RS Tag, obtain proper authorizing signatures and distribute xerox copies to:

Corrective Action Board
Material Control
Originator
Others as required by program

- b. Upon completion of rework and acceptance, the RS Tag hard copy will be stamped by Quality Control and returned to Quality Engineering. File the RS Tag hard copy and original (white) with attached data and supplements.

- 3.2.2 Scrap - When rework cannot be accomplished or item is damaged and otherwise unusable, it will be scrapped. Proceed as follows:

- a. Complete RS Tag and indicate: "Scrap"
- b. Obtain signature of Quality Control Supervisor and Quality Manager.
- c. Remove affected hardware from Quality Withholding Area and place it in Bonded Scrap Crib. Place hardback copy of RS Tag with or attached to the part(s).

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3.2.2 Scrap - (Cont'd)

- d. Distribute xerox copies of the RS Tag per Paragraph 3.2.1 (a).
- e. See Q.D. 3.5 for further scrap control instructions.

3.2.2.1 Items declared "Scrap" by Engineering change shall be confiscated and placed in Bonded Scrap Crib after coordination with Material Control. Document scrappage on an RS Tag as in Paragraphs (a) and (b) above.

3.2.3 Refer to Corrective Action Board - Items that are not dispositioned by Quality Engineering as "Rework" or "Scrap" shall be submitted to the CAB for action and disposition. Upon receipt of CAB disposition instructions, the Quality Engineer will complete the RS Tag as follows:

- a. Obtain signatures of Quality Engineering Supervisor and Quality Manager.
- b. Distribute copies of the RS Tag in accordance with Paragraph 3.2.1 (a) above.
- c. Upon completion of disposition instructions, receive the hardback copy of the RS and file it with the RS original and a copy of the CAB Report, NSD-13 (Figure 6).

4. NOTES/APPENDIX**4.1** Figures

- Figure 1 - Manufacturing Order, Form ESD-209
- Figure 2 - Material Acceptance Tag, NSD-33
- Figure 3 - Material Acceptance Tag (large)
- Figure 4 - Isotopes Reporting System (RS), Form NSD-16
- Figure 5 - RS Supplement, Form NSD-15
- Figure 6 - CAB Report, Form NSD-13

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MANUFACTURING ORDER

PART NO. 4000	CITY CHN	SUB TASK CTLPT	INSP. REQ. YES <input type="checkbox"/> NO <input type="checkbox"/>	REJECT	DATE	DATE	
NAME/DESCRIPTION MATL	ACCOUNT NO.	OPERATIONS CODE L=LATHES M=MILLS JB=JIGBORE EDM=ELEC DISC MACH. SIM=SHIELD METAL W=WELD M-A=MACH ASSY. AT=ASSY/TEST SR=STOCK ROOM CP=CLEAN/PAINT OV=OUTSIDE VENDOR	M O N O	ROUTE TO:			GENERAL NOTES:
P.O. NO.	DATE	SCHED. DATE	SCHED. COMPL. DATE	ACTUAL HRS.	EST. HRS.	QTY. COMPL.	NOTES
DATE	TO:	FROM:	NAME:	ACTUAL HRS.	EST. HRS.	QTY. COMPL.	NOTES

Figure 1

Part No. 452 A600025-039	DCN D
Quan. 1	TELETYPE O.C. 4-10-73
FL/No. V 65360	Ser. No. 104
RS NSD-33	P.O.

Figure 2

Part No. 452 A600003-003	DCN C		
Quan. ONE	TELETYPE O.C. ISOTOPES 12/26/73		
FL/No. N05761	Ser. No.		
RS	P.O. B62370		
CLEANING method of PS2300033	DATE 3/2/73	MEG 1316	
TAKE CUT-AIR	TYPE		
PS0200001			
OUTGAS-VAC.	METHOD		
PS0200001			
OUTGAS-	TYPE		
PS0200000			
LEAK			
RATE			

Figure 3

TELEDYNE
ISOTOPES

CORRECTIVE ACTION BOARD REPORT

RS NO.	_____
PART NO.	_____
PAGE	_____ OF _____

CAC DISPOSITION / APPROVAL	DATE
DESIGN ENGINEER _____	
RELIABILITY ENGINEER _____	
QUALITY ENGINEER _____	
CUSTOMER _____	

ISO-13 (S-71) INSTRUCTIONS FOR THE PREPARATION OF THIS FORM ON REVERSE SIDE.

Figure 6

Note: *Obtain customer signature when required by contract.

TITLE: HANDLING OF SCRAP AND SALVAGE HARDWARE		
ORIGINATED BY: A. M. Konjura	DIRECTIVE NO. 3.5	REV. C
REVISED BY: A. M. Konjura	REVISION DATE 5/1/72	
REVIEWED BY: <i>R.P. Brund</i>	ORIGINAL ISSUE DATE 6/4/71	
APPROVED: <i>J. J. Ford</i>	PAGE 1 OF 5	

1. SCOPE

1.1 Summary

This directive describes the methods and controls used to effectively control scrap and salvage materials. Both Commercial and Government contract materials may be scrapped under this directive.

1.2 Purpose

The proper execution of this directive assures the prevention of mixing of scrap and salvage materials with acceptable production materials hardware, and provides a system for orderly and economical disposition of scrapped and salvaged materials.

1.3 Reference

a. Quality Procedure 3.0, "Material Control."

1.4 Limitations

This directive does not apply to disposition and sales of radioactive and non-contract surplus materials and equipment.

2. RESPONSIBILITIES

2.1 Quality Engineering

Quality Engineering is responsible for monitoring the scrap and salvage control methods and operations and for assuring that instructions are followed within the Quality Operations Organization.

2.2 Quality Control

Quality Control is responsible for withholding defective and obsolete materials from production.

Q. D. 3.5 C
Page 2
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2.3 Material Control

Material Control is responsible for storage, physical control and movement of scrap materials after release by the Scrap Control Team.

2.4 Facilities

Facilities shall be responsible for the sale and final disposal of scrap material.

3. REQUIREMENTS

3.1 Scrap Disposition

All procured or fabricated items to be scrapped shall be handled as described in the following paragraphs.

3.1.1 Removal From Production - Quality Directive 3.4 provides for the removal of discrepant material from acceptable production material and placement in the Quality Withholding Area to await Quality Engineering action.

3.1.2 Removal From Withholding Area - Material which has been formally dispositioned as "Scrap" shall be removed by Quality Engineering from the procurement and Quality Withholding Areas and placed in the Bonded Scrap Crib. The hardback copy of the Reporting System (RS) Tag, NSD-16 (Fig. 1) shall be attached to each item or group of items to be scrapped.

3.1.2.1 All items in the Bonded Scrap Crib are retained for a minimum of 30 days before removal by the Scrap Control Team. This holding period will allow for any additional research and corrective action evaluation.

3.1.3 Review of the Bonded Scrap Crib - The Scrap Control Team (Quality Control Supervisor, a Quality Engineer, and the Material Control Manager) shall conduct a monthly review of the Bonded Scrap Crib to remove all items which have exceeded the 30 day hold limit and all other obsolete items. Obsolete items may be production overages or other items removed from production by engineering change.

3.1.3.1 Scrapped items which have no salvage value other than metallic weight shall be destroyed or mutilated to prevent re-use as production. These items and other obsolete hardware shall be delivered to Material Control for storage awaiting disposal.

3.1.4 Storage - Material Control shall transport scrapped material to the salvage area for storage.

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3.1.4.1 Contract salvage hardware shall be kept separate from company owned salvage materials.

3.1.5 Sale and Disposal - Facilities shall arrange for prompt sale/disposal and removal of scrap materials and shall be accountable to the Accounting Department for monies received and transaction records.

3.2 Documentation of Scrap Materials

All material scrapped shall be properly documented before disposition and when and how disposed of in order to adequately record the action and to verify any return on the sale thereof.

3.2.1 Reporting System Record - Non-conforming material to be scrapped shall be documented by completion of a Reporting System (RS) Tag, NSD-16 (Fig. 1) reflecting the decision and authority to "SCRAP." (Refer to Q. D. 3.4 and 3.6 for preliminary documentation instructions for non-conforming and obsolete hardware.)

3.2.1.1 When the material has been disposed of and the RS Tag has been signed off by a member of the Scrap Control Team, the completed hardback copy will be filed with the RS Tag original in the Quality file.

3.2.1.2 Scrap Disposition Record - A member of the Scrap Control Team shall denote completion of RS Tag disposition instructions by signing, dating and printing the word "SCRAP" across the acceptance blocks on the back of the hardback copy of the RS Tag.

3.2.1.3 A record of items, physically destroyed and/or released to Material Control as scrap, is prepared by a member of the Scrap Control Team after each review of the Bonded Scrap Crib. This record is in memo form listing the scrap as follows:

Program/Account No./Quantity/Part No./RS Tag No.

This memo is to be sent to the Program Contract Administrator with copies to the members of the Scrap Control Team and Facilities. The Quality Engineer will file his copy for the record.

3.2.2 Operation Directive to Surplus and Scrap Material - Obsolete or surplus material may be declared scrap by an Operations Directive published by the Contract Administrator. This document may authorize the removal of material from production to the Scrap Storage Area for disposal.

3.2.2.1 Copies of the Operations Directive shall be used to release material from Material Control to Facilities for disposal.

Q. D. 3.5 C
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3.2.3 Sales of Scrap Records - Facilities shall, after sale of scrap material:

- (1) forward the original copy of the transaction record, funds received from the sale, and a copy of the scrappage list or Operations Directive, to the Accounting Department;
- (2) retain a copy of all sales transactions and applicable scrappage list or Operations Directive.

All sales transactions shall be documented by receipt listing the items or type of material sold, purchaser, and funds received.

4. APPENDIX

4.1 Figures

Figure 1 - Reporting System (RS) Tag, NSD-16.

QUALITY DIRECTIVE

TITLE: QUALITY CONTROL OF PROCURED MATERIAL		
ORIGINATED BY A. Konjura	DIRECTIVE NO 3.6	REV B
REVISED BY M. J. Kaplow	REVISION DATE 5/1/72	
REVIEWED BY <i>R. P. Bernd</i>	ORIGINAL ISSUE DATE 6/4/71	
APPROVED <i>G. J. Hood</i>	PAGE 1 OF 11	

1. SCOPE

1.1 Summary

This directive provides guidelines for the flow and Quality documentation of conforming and non-conforming procured material.

1.2 Purpose

To assure control and adequate quality documentation of procured material as required by contract and standard quality practice.

1.3 References

- a. Quality Procedure 3.0, "Material Control."
- b. Quality Procedure 5.0, "Quality Engineering."
- c. Quality Procedure 6.0, "Data and Reports."

2. RESPONSIBILITIES

2.1 Quality Engineering

Quality Engineering shall evaluate defects, failures, and other anomalies concerning procured material, coordinate and resolve problems with vendors, and disposition material in accordance with procedures herein prescribed or which are contractually required.

2.2 Quality Control

Quality Control shall inspect and process procured materials in accordance with requirements of the purchase orders, drawings, specifications, or special instructions and shall document actions as directed herein.

Q. D. 3.6 B
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2.3 Purchasing

Purchasing is responsible for vendor or supplier coordination and liaison and negotiations regarding procured material discrepancies and vendor corrective action.

3. REQUIREMENTS

3.1 Receiving Inspection

Inspection personnel shall inspect parts to verify conformance to the purchase order, applicable drawings, special requirements and specifications, and document the procured material as required and defined herein.

3.1.1 Material Inspection, General - Upon receipt of procured material, parts or equipment, and four (4) copies of the Receiving Report from Material Control, the inspector will pull the purchase requisition/purchase order (PR/PO) package from the Receiving Inspection Control File. Upon review of the purchase order, the inspector will obtain any drawings or specifications required to inspect the material and proceed as follows:

3.1.1.1 Check the vendor's packing slip, included data, and certifications for compliance with the purchase order requirements.

3.1.1.2 Inventory and verify that the material is that which is listed on the purchase order and is correctly marked and/or labeled.

3.1.1.3 Note any damage to material caused by shipping. When damage is found, initiate Reporting System Tag (RS) NSD-16 (Fig. 5) and immediately notify Material Control for coordination with the carrier. Note all damage on the RS tag, photograph if necessary, and notify Quality Engineering for a packaging evaluation, if packaging method appears defective.

3.1.1.4 Physically inspect the material for compliance with the drawings. Use an approved Sampling Plan, when permissible, for large lots of material (see Quality Directives, Series 4.X).

3.1.1.5 When required, other inspections, tests and verifications, such as electrical, chemical, x-ray, etc., shall be accomplished as indicated on the Receiving Inspection Instruction, Form NSD-42 (Fig. 1), and stamped off and dated when accomplished. Test and verification data sheets shall be attached to the Receiving Inspection Instruction for filing.

3.1.2 Conforming Material - When material meets all listed requirements, data will be processed as detailed below.

Q. D. 3.6 B
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- 3.1.2.1 Clear purchase order by entering pertinent receiving inspection information, inspection stamp, and date on the four (4) copies of the Receiving Report.
- 3.1.2.2 Complete the Receiving Inspection Instruction, when applicable.
- 3.1.2.3 Clear the Quality Log when the part was sent outside for a controlled operation. Forward the Quality Log to Quality Engineering when complete. When incomplete, forward Quality Log with material to Material Control.
- 3.1.2.4 Make entry on the vendor Receiving Inspection, Form Q-318 (Fig. 3).
- 3.1.2.5 Forward to Quality Engineering the Quality copy of the Receiving Report with the PO/PR, Certification Test Reports, and attach a signed report copy of the Receiving Inspection Instruction (Report Copy, Fig. 1), when applicable.
- 3.1.2.6 Prepare an Acceptance Tag (Fig. 4) and attach or place with parts. When required by contract, the Customer Representative will stamp the Acceptance Tag.
- 3.1.2.7 Route accepted parts with three (3) copies of the signed-off Receiving Report to Material Control.
- 3.1.3 Non-Conforming Material - Initiate an RS Tag (Fig. 5) for discrepant procured material, process the RS Tag and material as defined in Quality Directive 3.3 and detailed below.
 - 3.1.3.1 The Quality Control Supervisor will contact Purchasing and obtain buyer's signature on the RS Tag to signify acknowledgement of the discrepant condition. Submit the goldenrod copy of the RS Tag to Purchasing.
 - 3.1.3.2 Attach or place the hard copy of the RS Tag with the discrepant material and move the material to Procurement Withholding Area.
 - 3.1.3.3 The white and green copies of the RS Tag are forwarded to Quality Engineering for evaluation of the discrepancy and material disposition.
 - 3.1.3.4 Quality Control shall transfer discrepant items to Material Control upon receipt of RS Tag instructions from Quality Engineering.
 - 3.1.3.5 Stamp (accepted material) or sign (rejected material) the hardback copy of the RS Tag to indicate completion of disposition instructions and forward it to Quality Engineering.

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3.2 Quality Engineering

Quality Engineering shall review non-conforming items and, as such, will receive all RS forms, review discrepancies, make disposition, determine cause, and propose corrective action. The green copy of the RS Tag is immediately filed upon receipt as a record copy while disposition and evaluation is being accomplished utilizing the Master (white) copy.

- 3.2.1 Documentation Discrepancies - Shortages or errors in documentation, such as missing certifications, analyses, manuals or other data, may be resolved by initiating a Supplier Corrective Action Request (SCAR), Form NSD-17 (Fig. 6). The SCAR shall define the shortage or error and request vendor correction by supplying the corrected or missing document(s) and corrective action to be taken to prevent recurrence.
- 3.2.1.1 Obtain approval signature of the Quality Manager, forward a copy of the SCAR to Purchasing (the buyer) with a Xerox copy of the dispositioned RS Tag, and place the original of the SCAR with the RS Tag master awaiting action by the vendor.
- 3.2.1.2 Purchasing shall submit the SCAR to the vendor requesting action and the return of the SCAR with the correct documentation to Quality Engineering.
- 3.2.1.3 Upon receipt of the correct documentation from the vendor, Quality Engineering shall review the documentation and complete the RS Tag master.
- 3.2.1.4 Forward the received vendor documents to Inspection for attachment to the Receiving Report package.
- 3.2.1.5 Forward a copy of the completed RS Tag to Inspection for clearance of the material being held.
- 3.2.1.6 Receive the hardback copy of the RS Tag upon release of the material and file it with the RS Tag master.
- 3.2.2 Return to Vendor - Material which cannot be accepted without Vendor rework or replacement shall be returned to the Vendor.
- 3.2.2.1 Complete the RS Tag and disposition and material to be "Returned to the Vendor." Cause and suggested corrective action may be added when evident.
- 3.2.2.2 Prepare a Supplier Corrective Action Request (SCAR) (Fig. 6) describing the problem. Forward an approved copy of the SCAR to Purchasing along with a Xerox copy of the RS Tag. A requested reply date shall be applied commensurate with the nature and criticality of the non-conformance (10-30 days).

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- 3.2.2.3 Distribute Xerox copies of the RS Tag to the following:
- Purchasing
 - Material Control
 - Originator
 - Receiving Quality Control
 - Others as required by program
- 3.2.2.4 Receive hardback copy of RS Tag upon completion of disposition and file with the RS Tag master.
- 3.2.2.5 When corrective action (SCAR) is received from the Vendor, review same and, if acceptable, sign, attach a copy to the original with the RS Tag master, and file.
- 3.2.3 Hold Material for Vendor Review - Material to be held awaiting shipping instructions or vendor review shall be kept in the Procurement Withholding Area.
- 3.2.3.1 Complete RS Tag and SCAR and process as in Paragraph 3.2.2.2.
- 3.2.3.2 At the joint discretion of the Quality Engineer and the Buyer, and with the approval of the Manager, Quality Operations, non-conforming materials may be held for a reasonable period (thirty days) in the Procurement Withholding Area for Buyer/Vendor disposition.
- 3.2.3.3 Upon disposition to have material returned to Vendor, process as in Paragraph 3.2.2.
- 3.2.3.4 At the end of the thirty-day holding period, if the discrepancy has not been resolved because of vendor negligence in reviewing the material, the RS Tag may be dispositioned "Return to the Vendor." (Process per 3.2.2)
- 3.2.3.5 When Vendor agrees to repair or scrap material at Vendor expense, process and disposition the RS Tag per Q. D. 3.4, Paragraph 3.2.1 or 3.2.2.
- 3.2.3.6 Complete RS Tag including disposition instructions and distribute Xerox copies per Paragraph 3.2.2.4. Include copies of the completed SCAR with each RS Tag.
- 3.2.3.7 Receive the hardback copy of the RS Tag upon completion of the disposition of material and file it with the RS Tag master.
- 3.2.3.8 File the Receiving Report package in the Purchase Order Control File.

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4. NOTES/APPENDIX

4.1 Notes

Non-conforming items which cannot be placed in the Withholding Area or Bonded Scrap Crib because of size, thermal and/or radiation characteristics, etc. , may remain in any other safe location provided the RS Tag is prominently displayed. Items of this type are to be dispositioned expeditiously to minimize the amount of time that discrepant items are held outside of a bonded area.

4.2 Figures

Figure 1 - Receiving Inspection Instruction, NSD -42


Figure 2 - Receiving Inspection Instruction Continuation Sheet, NSD -42A

Figure 3 Vendor Receiving Inspection Record, Form Q-318

Figure 4 Acceptance Tag

Figure 5 Reporting System Tag, NSD-16

Figure 6 - Supplier Corrective Action Request, NSD-17



RECEIVING INSPECTION INSTRUCTIONS
QUALITY REPORT

PART NUMBER _____		DESCRIPTION _____					
PURCHASE ORDER # _____		RECEIVING REPORT # _____ PART S/N _____					
SPECIAL REQUIREMENTS - CHECK APPLICABLE BLOCKS:							
DOCUMENTATION	YES	NO	VERIF.	MARKING	YES	NO	VERIF.
SPECIFICATIONS/MANUALS				INSD PART NUMBER			
CERTIFICATIONS				MANUFACTURER'S PART #			
TEST REPORTS				MANUFACTURER'S NAME/MARK			
MATERIAL ANALYSIS				SERIALIZED ITEM			
SCOUR INSPECTION EVIDENCE				FEDERAL STOCK NUMBER			
CALIBRATION DATA				AGE/LIFE CONTROL DATE			
TRACEABILITY				INSPECTION MARKS/STAMP			
NOTE: Review required certifications or data to assure conformance with requirements. Verify by indicating "YES" or "NO" in VERIF. block.							
SPECIAL INSTRUCTIONS: _____							
CHARACTERISTICS TO INSPECT				INSP. STAMP	DEFECT CL. MAJ. MINOR		INSTRUMENT OR GAGE

NSD-42 (9/71)

Inspected By _____, Date _____

Figure 1

RECEIVING INSPECTION INSTRUCTIONS
QUALITY REPORT

CONTINUATION SHEET

PART NUMBER _____		DESCRIPTION _____		
CHARACTERISTICS TO INSPECT		INSP. STAMP	DEFECT CL. MAJ. MINOR	INSTRUMENT OR GAGE

NSD - 42A (9/71)

Inspected By _____, Date _____

Figure 2

Q.D. 3.6
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Part No.		DCN
Quan.	Q.C.	
FL/No.	Ser. No.	
RS	P.O.	
NSD-33		

Part No.		DCN	
Quan.	Q.C.		
FL/No.	Ser. No.		
RS	P.O.		
CLEANING	DATE	MFG	QC
PS _____			
BAKE OUT-AIR	TYPE		
PS0200001			
OUTGAS-VAC.	METHOD		
PS0200001			
OUTGAS-	TYPE		
PS0200008			
LEAK			
RATE: _____			

Figure 4. Acceptance Tags

Q.D. 3.6 B
 Page 10
 5/1/72

				S/N 6190	
PROGRAM	ACCOUNT NO.	MANUFACTURER	DATE	FOLDER LIST NO.	TELEDYNE ISOTOPES REPORTING SYSTEM
ITEM PART NO.	ITEM S/N	ITEM NAME		P.O. NO.	
NEXT ASSY PART NO.	NEXT ASSY S/N	NEXT ASSY NAME		INITIAL RPT NO.	
ITEM	TOTAL QTY	QTY DEFECT	DESCRIPTION OF EVENT		
ACKNOWLEDGEMENT					
QUALITY DEPARTMENT DISPOSITION INSTRUCTIONS				REPORTED BY	
				DATE	
				QUALITY SUPERVISOR	
				QUALITY MANAGER	
				DISPOSITION APPROVAL	
				DATE	
				QUALITY ENGINEER	
				QUALITY MANAGER	

INSTRUCTIONS FOR COMPLETING THIS FORM, AND FINAL ACCEPTANCE BLOCKS ON REVERSE SIDE OF HARD BACK COPY.

MSD-16 (5-71)

Figure 5



SUPPLIER CORRECTIVE ACTION REQUEST

SCAR NO. _____

PART NO.		PART NAME		SUPPLIER NAME AND ADDRESS
BUYER	P.O. NO.	QTY. REJ.		
DESCRIPTION OF DISCREPANCY OR PROBLEM				
<input type="checkbox"/> INFORMATION ONLY		<input type="checkbox"/> FORMAL REPLY REQUIRED BY		(DATE)
ORIGINATION SIGNATURE	DATE	APPROVAL SIGNATURE	DATE	

"YOU ARE REQUIRED TO CONDUCT A COMPLETE INVESTIGATION OF THE LISTED DISCREPANCIES AND SUBMIT A WRITTEN REPORT LISTING REASONS, CAUSES AND CORRECTIVE ACTION. WHEN GOVERNMENT SOURCE INSPECTION APPLIES, YOUR INVESTIGATION AND REPLY MUST BE SIGNED BY THE GOVERNMENT QUALITY REPRESENTATIVE AT YOUR PLANT. REPORT MUST BE SIGNED BY A RESPONSIBLE MEMBER OF YOUR MANAGEMENT, AND SUBMITTED TO TELEDYNE ISOTOPES NSD. ITEMIZE ANSWERS BELOW. INSPECTION OF SUBSEQUENT RECEIPTS FOR PURPOSES OF ACCEPTANCE OR REJECTION WILL DEPEND UPON THE TIMELY RECEIPT AND APPROVAL OF YOUR REPORT BY TELEDYNE ISOTOPES NSD QUALITY."

POSITIVE CORRECTIVE ACTION

CAUSE (STATE SPECIFIC CAUSE OF DISCREPANCY OR PROBLEM)

ACTION (STATE SPECIFIC ACTION TAKEN TO PREVENT RECURRENCE OF THE DISCREPANCY OR PROBLEM)

EFFECTIVITY _____ DATE	AND/OR _____ UNIT SERIAL NO.	TELEDYNE ISOTOPES NSD QUALITY REPRESENTATIVE (SIGNATURE) <input type="checkbox"/>
SUPPLIER'S Q. C. MANAGEMENT (SIGNATURE)	DATE	GOVERNMENT QUALITY REPRESENTATIVE (SIGNATURE) <input type="checkbox"/>

Figure 6

TITLE: CORRECTIVE ACTION BOARD SYSTEM		
ORIGINATED BY: A. M. Konjura	DIRECTIVE NO. 3.7	REV. C
REVISED BY: D. D. Sampat	REVISION DATE 6/16/78	
REVIEWED BY: <i>[Signature]</i>	ORIGINAL ISSUE DATE 5/1/72	
APPROVED: <i>A. A. McDonald</i>	PAGE 1 OF 7	

1. SCOPE

1.1 Summary

This document defines the composition, function and authority of a Corrective Action Board.

1.2 Purpose

To insure that the material review system for non-conforming items operates within the bounds of program requirements.

1.3 References

- a. NRA-1, "Quality Assurance Program Requirements," July 1, 1977.

2. RESPONSIBILITIES AND REQUIREMENTS

2.1 Corrective Action Board (CAB) Membership and Chairman

Responsible Managers/Supervisors will designate one primary and one alternate representative for each of the below listed functional areas for each program requiring Corrective Action Board support. (The Quality Engineering representative will serve as chairman of the Corrective Action Board unless otherwise stipulated in approved program direction.)

- a. Quality Engineering
- b. Design Engineering
- c. Reliability Engineering
- d. Materials Engineering

2.2 Quality Engineering

The designated program Quality Engineer will make initial disposition on all Reporting System (RS) Tags (Figure 1), referring those requiring Corrective Action Board involvement to the CAB. On discrepancies, as defined per the Reporting System Tag, that are submitted to the Corrective Action Board for final disposition, Quality Engineering will be responsible for the initial investigation to determine information concerning the cause of the discrepancy and will make recommendations to the Corrective Action Board on suitable corrective action.

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6/16/78
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2.3 Corrective Action Board

The Corrective Action Board will be responsible for reviewing instances of nonconformance, determining their cause, specify or propose suitable corrective action as appropriate and dispositioning non-conforming or suspected non-conforming items which are referred to the Board. The Corrective Action Board has the option of reviewing items which are not referred to the Board.

2.4 All Departments

All departments will render appropriate support, both functional and technical, to the Corrective Action Board upon its request.

2.5 Customer Approval of Board Members

Customer approval of board members will be necessary when required by approved program documentation.

3. AUTHORITY

3.1 Corrective Action Board

All Corrective Action Board decisions are final.

3.2 Quality Engineering

Quality Engineering with appropriate program approval¹ can release material within TES if required prior to the receipt of certification from the vendor or supplier. Final release can only be accomplished if certifications are received or the material is dispositioned "use as is" by the CAB.

4. BOARD FUNCTIONING

4.1 Board Meeting

Board meetings will be called by the Board Chairman on an "as required" basis. Designated alternates will participate in Corrective Action Board activities in the event of unavailability of the primary representative, or in circumstances where the participation of the alternates is preferable.

¹ Associated with this action will be a program approved stamp requiring program signature for release of hardware within TES.

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4.2 Board Decisions

The Corrective Action Board will review discrepancies referred to them and make a disposition based on all or any of the following:

- a. a review of data submitted with the discrepant item
- b. an evaluation of the discrepant hardware
- c. analysis of additional test data
- d. consultation with knowledgeable persons beyond the membership of the Board

4.2.1 Classification of Decisions - The Corrective Action Board will reach a decision to disposition a nonconformance as "use as is," "rework," "scrap," "repair," or "restricted usage."

4.2.1.1 The Corrective Action Board may disposition a discrepant part as "use as is" if the defect is judged to have no adverse effect on the fit or function of the part.

4.2.1.2 The Corrective Action Board may disposition a part for "rework" if such rework may return the discrepant part to its original specifications.

4.2.1.3 The Corrective Action Board may disposition a part as "scrap" when the defect is judged to adversely affect the performance of the part and rework/repair is not justified or practical.

4.2.1.4 The Corrective Action Board may disposition a part for "restricted usage" such as test usage, non-flight usage, or other limited applications. The specific usage may be defined at the time the tag is dispositioned or at some future date. In the latter case, the part will be held in the Quality Withholding Area pending final disposition. All parts retained in the Quality Withholding Area are subject to the limitations of Quality Directive 3.5, "Handling of Scrap and Salvage Hardware."

4.2.1.5 The CAB may disposition a part for "repair" providing an acceptable repair is possible and will return the part to its intended usage. Procedures shall be established or approved by the CAB to perform this repair. Procedures shall include appropriate inspections and/or tests to verify the acceptability of the repair.

4.2.2 Board Agreement - All Corrective Action Board dispositions except "scrap" will require unanimous agreement by all board members.

4.2.3 Customer Approval - Discrepant items which are dispositioned "use as is," or dispositions which require extensive and/or unusual rework or testing, will be submitted to the customer for his approval when required by contract.

4.3 Recording of Corrective Action Board Dispositions

All Corrective Action Board dispositions will be documented using Corrective Action Board Report Form No. NSD-13 (5-71), (Figure 2). Completion of this form requires signatures of all the Board members and the customer representative, when required by contract. The disposition should include (1) Cause of Event, (2) Corrective Action Taken, and (3) Final Disposition, and other categorization as necessary.

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- 4.3.1 Distribution of Corrective Action Board Dispositions - Quality Engineering will be responsible for distributing copies of all Corrective Action Board dispositions. Distribution is to be made in accordance with Quality Directive 3.4 and 3.6.
- 4.3.2 Maintenance of Records - Quality Engineering will be responsible for maintaining a master file of all Corrective Action Board transactions.
 - 4.3.2.1 Quality Engineering will maintain an "open" file for Corrective Action Board Reports which have incomplete corrective action items. These CAB Reports will be transferred to the master file upon completion of the required corrective actions.
- 4.3.3 Corrective Action Status Report - Depending upon program or customer direction, Quality Engineering will be responsible for issuing a bi-weekly status report (Figure 3) which will show all open corrective action items, individuals responsible for their completion and due date for completion.
 - 4.3.3.1 Copies of the Corrective Action Status Report will be distributed to Program Management and to the people who are directly or indirectly involved for completion of Corrective Action items. Quality Engineering shall monitor and follow-up on all open Corrective Actions.

5. NOTES/APPENDIX

5.1 Figures

- Figure 1 - Teledyne Isotopes Reporting System Tag, Form No. NSD-16 (5-71)
- Figure 2 - Corrective Action Board Report, Form No. NSD-13 (5-71)
- Figure 3 - Corrective Action Status Report, Form No. NSD-48

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**TELEDYNE
ISOTOPES**

CORRECTIVE ACTION BOARD REPORT

RS NO. _____

PART NO. _____

PAGE _____ OF _____

Materials Engineer

CAB DISPOSITION APPROVAL		DATE
DESIGN ENGINEER _____		
RELIABILITY ENGINEER _____		
QUALITY ENGINEER _____		
CUSTOMER _____		

KSD-13 (5-71) INSTRUCTIONS FOR THE PREPARATION OF THIS FORM ON REVERSE SIDE.

Figure 2
(Corrective Action Board Report)

CORRECTIVE ACTION STATUS REPORT

RS NO.	PART NAME AND PART NO.	CORRECTIVE ACTION REQUIRED	CORRECTIVE ACTION RESPONSIBILITY	DATE		
				ASSIGNED	DUE	COMPLETED

NSD-48

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Figure 3
(Corrective Action Status Report)

QUALITY DIRECTIVE

TITLE: INSPECTION SAMPLING PLAN (GENERAL PURPOSE)		
ORIGINATED BY: A. M. Konjura (Q.D. 4.001)	DIRECTIVE NO. 4.1	REV. A
REVISED BY: A. M. Konjura	REVISION DATE 5/1/72	
REVIEWED BY: <i>RP Beard</i>	ORIGINAL ISSUE DATE 8/26/70	
APPROVED: <i>JF Wood</i>	PAGE 1 OF 4	

1. SCOPE

1.1 Summary

This directive defines a sampling plan suitable for use with both in-house and vendor fabricated piece parts and instructions for the proper usage of the sampling plan.

1.2 Purpose

To provide a sampling plan suitable for use in the inspection of large quantities of piece parts.

1.3 References

- a. Quality Procedure 4.0, "Acceptance Sampling."
- b. Dodge, H. F., and Romig, H. G., "Sampling Inspection Tables - Single and Double Sampling," John Wiley & Sons, Inc., 1944.

2. RESPONSIBILITIES

2.1 Quality Engineering

Quality Engineering will be required to render any technical assistance needed to assure successful implementation of the sampling plan.

2.2 Quality Control

Quality Control will be responsible for the selection and inspection of hardware and the recording and maintenance of documentation associated with the use of the sampling plan.

3. REQUIREMENTS

3.1 Quality Control

3.1.1 Sampling Procedure

The sampling plan will be utilized in accordance with the following instructions.

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- 3.1.1.1 Randomly select and inspect a quantity of pieces equal to that specified in Table 1 under "1st sample size."
- 3.1.1.2 If the number of defectives found in the sample does not exceed the "1st acceptance number" shown in Table 1, accept the lot, but reject any defectives found in the sample.
- 3.1.1.3 If the number of defectives found in the sample exceeds the "2nd acceptance number," reject the lot.
- 3.1.1.4 If the number of defectives found in the sample exceeds the "1st acceptance number" but does not exceed the "2nd acceptance number," randomly select and inspect another sample equal to that shown under "2nd sample size" in Table 1.
- 3.1.1.5 If the total number of defectives found in the first and second samples combined does not exceed the "2nd acceptance number" in Table 1, accept the lot, but reject any defectives found in the sample.
- 3.1.1.6 If the total number of defectives found in the first and second samples combined exceeds the "2nd acceptance number" in Table 1, reject the lot.
- 3.1.2 Sampling Inspection Records

Records will be maintained of all inspections performed on a sampling basis. These records will include as a minimum:

- a. Part number
- b. Type of inspection
- c. Lot size
- d. Sample size(s)
- e. Quantity accepted
- f. Quantity rejected
- g. Disposition of lot

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3.1.3 Review of Records

Prior to initiating sampling inspection on any lot/batch of parts, the sampling history of that part will be reviewed. Evidence of poor past performance as determined by the Quality Control Supervisor will be cause for 100% inspection.

4. NOTES/APPENDIX

4.1 Table 1

Double Sampling Plan AOQL = 1.0%.

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TABLE 1
DOUBLE SAMPLING PLAN AOQL = 1.0% *

Lot Size	1st Sample Size	1st Acceptance Number	2nd Sample Number	2nd Acceptance Number
1 - 25	All	0	N. A.	N. A.
26 - 50	22	0	N. A.	N. A.
51 - 100	33	0	17	1
101 - 200	47	0	43	2
201 - 300	55	0	50	2
301 - 400	60	0	80	3
401 - 500	60	0	95	3
501 - 600	65	0	100	3
601 - 800	70	0	140	4
801 - 1000	125	1	180	6

*Dodge, H. F. and Romig, H. G., "Sampling Inspection Tables - Single and Double Sampling," John Wiley & Sons, Inc., 1944.



QUALITY DIRECTIVE

TITLE: PERIODIC INTERNAL QUALITY AUDITS		
ORIGINATED BY A. M. Konjura (Q.D. 5.003)	DIRECTIVE NO 5.3	REV A
REVISED BY A. M. Konjura	REVISION DATE 5/1/72	
REVIEWED BY <i>RP Bennett</i>	ORIGINAL ISSUE DATE 9/29/70	
APPROVED <i>J. L. Wood</i>	PAGE 1 OF 6	

1. SCOPE

1.1 Summary.

This document defines the method and timing for accomplishing internal audits of fabrication, test, storage processes, facilities, and Quality operations.

1.2 Purpose

To assure adherence to internal operating specifications.

1.3 Reference

- a. Quality Procedure 5.0, "Quality Engineering"

2. RESPONSIBILITIES

2.1 Quality Engineering

Quality Engineering will define which areas/processes will be audited, the timing and frequency of audits, maintain all documentation associated with the audits, and participate as an audit team member, when required.

2.2 Quality Control

Quality Control will conduct audits as specified by Quality Engineering, report audit results, and pursue corrective action follow-up activities.

2.3 All Departments

All departments will be required to furnish personnel to serve as audit team members upon the request of Quality.

2.4 Quality Manager

The Quality Manager will approve both the audit plans and those individuals responsible for conducting audits.

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3. REQUIREMENTS

3.1 Audit Types

Audits will include as a minimum, but will not necessarily be limited to items such as Quality functions, Manufacturing processes, and areas such as fabrication, test, and storage facilities.

3.1.1 Quality Audits - Quality functions, as described in Quality Directives, will be audited to determine compliance with the requirements of the applicable documents.

3.1.2 Process Audits - The Manufacturing department will be audited to determine compliance with the requirements of the pertinent Process Specification.

3.1.3 Fabrication and Test Area Audits - Fabrication and testing areas such as the thermoelectric area, plating and finishing area, generator assembly area, generator testing area, etc., will be audited to verify fulfillment of contract requirements including adherence to processes, procedures, and specifications, adequacy of log control and data recording, and general housekeeping.

3.1.4 Storage Area Audits - Stockrooms will be audited for items such as identification of material and parts, adequacy of storage facilities, adherence to applicable storage requirements, and general housekeeping.

3.2 Frequency of Audits - Audits will be conducted bi-monthly. Audit items selected by Quality Engineering and approved by the Quality Manager will be based upon current experience factors.

3.3 Audit Planning - Audit plans will be prepared by Quality Engineering and approved by the Quality Manager prior to the initiation of an audit.

3.4 Notification of Audit - Audit plans will be submitted to the affected area Manager at least 24 hours prior to the start of the audit.

3.5 Auditing Personnel - All audits will be conducted by personnel approved by the Quality Manager.

3.6 Reporting Audit Results - A memorandum, supplemented if required by the use of forms shown in Figures 1 and 2, will be issued describing the findings of all audits. Distribution of all audit reports will be as follows:

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- a. Quality Manager
- b. Manager, department audited
- c. Responsible Supervisor
- d. Quality Engineering file

- 3.7 Discrepant Audit Items - The responsible department will be required to take corrective action on discrepant audit items within an appropriate time period.
- 3.8 Corrective Action Reporting - The department responsible for audit corrective action defines the corrective action taken by completing the Audit Reply (Figure 3) form and forwarding it to the Quality Manager.
- 3.9 Corrective Action Follow-Up Audits - The pertinent audit team will conduct a follow-up audit on discrepancies noted during the original audit to determine the effectiveness of the corrective action.

4. NOTES/APPENDIX

4.1 Figures

Figure 1 - Manufacturing/Test Area Audit Form

Figure 2 - Stockroom Audit Form

Figure 3 - Audit Reply

MANUFACTURING / TEST AREA AUDIT FORM

Audit No. _____

Area Audited: _____ Date of Audit: _____ Area Supervisor: _____

Check List	Status
1. General Housekeeping	
2. Equipment Calibration	
3. Evidence of Acceptable Parts	
4. Adherence to Procedures	
5. Adequacy of Data Recording	
6. Material Handling & Storage	

Auditors _____

Figure 1

STOCKROOM AUDIT FORM

Date of Audit: _____

Responsible Supervisor: _____

Check List	Status
1. General Housekeeping	
2. Shelf Life Items within allowable limits	
3. Evidence of Acceptance Inspection	
4. Check Parts for corrosion, damage and contamination.	
5. Parts identified properly	
6. Bin identification	
7. Segregation of parts to avoid mixing	
8. Parts stored in a manner to prevent damage	
9. Random check of records	

Auditors _____

Representative _____
(Area audited)

Figure 2

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Page 6
5/1/72

A U D I T R E P L Y

Area Audited _____ Date of
Audit _____

Corrective action taken: _____

Action taken to prevent recurrence: _____

Manager Date

Figure 3

QUALITY DIRECTIVE

TITLE: QUALITY PLANNING DOCUMENTATION		
ORIGINATED BY: J. K. Wenderoth/M. J. Kaplow	DIRECTIVE NO. 5.5	REV. A
REVISED BY:	REVISION DATE Original	
REVIEWED BY: <i>R.P. Brund</i>	ORIGINAL ISSUE DATE 5/1/72	
APPROVED: <i>K. J. Hood</i>	PAGE 1 OF 2	

1. SCOPE

1.1 Summary

This directive delineates planning functions performed by Quality Engineering.

1.2 Purpose

To identify the particular facets of the Quality Program performed to meet the contractual requirements of product control, product documentation and product acceptance.

1.3 Reference

- a. Quality Procedure 5.0, "Quality Engineering."
- b. Quality Procedure 6.0, "Data and Reports."

2. RESPONSIBILITY

2.1 Quality Engineering

Quality Engineering shall prepare and distribute the required documentation forms and in addition shall collect, review for completeness, and retain the completed documentation.

3. REQUIREMENTS

3.1 Quality Engineering Action

- 3.1.1 Inspection and Test Instructions/Plans - Review the contract and related documents to identify the acceptance requirements applicable to the program; and implement the program requirements by providing Quality Control with the necessary records, documentation and certification forms, and written inspection and test instructions to document objective evidence of compliance.
- 3.1.2 Configuration Records - Prepare and maintain Configuration Records from Engineering releases for deliverable items and record applicable changes in product logs for verification by inspection, as required.

Q. D. 5.5 A
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- 3.1.3 Quality Forms and Instructions - Determine the need for and originate or revise Quality forms and form instructions.
- 3.1.4 Record Retention - Provide for the recording and retention of Certification and Acceptance records and records as required by other Quality directives in accordance with contractual obligations and/or company needs.

QUALITY DIRECTIVE

TITLE: END ITEM DATA CONTROL		
ORIGINATED BY C. W. Rowe	DIRECTIVE NO 6.2	REV
REVISED BY <i>C. W. Rowe</i>	REVISION DATE	
REVIEWED BY <i>C. W. Rowe</i>	ORIGINAL ISSUE DATE April 8, 1974	
APPROVED <i>W. A. McDonald 4/10/74</i>	PAGE 1 OF 6	

1.0 SCOPE

1.1 Summary

This directive defines a method for controlling and documenting end item data and technical data.

1.2 Purpose

To assure that each deliverable end item is traceable back to the contract requirements and the work instructions, assuring that contract requirement and work instructions are compatible.

1.3 Reference

- a. Quality Procedure 6.0, "Data and Reports"

2. RESPONSIBILITIES

2.1 Quality Engineering

Quality Engineering is responsible for the origination of the work which will be documented on the Shipping Request Form (Form P4).

The Shipping Request Form is to be forwarded to Quality Control.

2.2 Quality Control

Quality Control is responsible for verification of the end item data to the specified work instruction and the itemized Material Inspection and Receiving Report - DD 250, as applicable.

2.3 Administration

Administration is responsible for preparation of the end item data into review packages for Quality Control, and for preparation of the Material Inspection and Receiving Report - DD 250. They shall forward prepared DD 250 with itemized end item data to Quality Engineering. They shall maintain a file of all completed DD 250 Forms.

Q. D. 6.2
Page 2
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2.4 Material Control

Material Control is responsible for packaging and shipment of the end item data and technical data as itemized on the Material Inspection and Receiving Report - DD 250, or as directed by contract.

A copy of the DD 250 will be returned to Administration and Quality Engineering on each individual shipment. The DD 250 copy will bear date of shipment.

3. REQUIREMENTS

3.1 Quality Engineering

Quality Engineering shall prepare the end item data and technical data work instructions by review of the data requirements specified in the applicable contract. Work instructions will be itemized on the Shipping Request Form (Form 74).

Quality Engineering shall evaluate all Reporting System Tags, preparing disposition instructions and corrective action. A copy of all completed tags shall be forwarded to Quality Control and Administration for required action. The original copy of all Reporting System Tags (Form NSD-16) shall be kept on file in Quality Engineering.

Quality Engineering shall perform independent end item data and technical data audits. These audits are to be performed at a minimum of twice a year. A report of each audit is to be forwarded to Quality Control, Administration, Material Control and the applicable Program Manager for required corrective action.

• 3.2 Quality Control

Quality Control shall review the Shipping Request Form and the Material Inspection Receiving Report as applicable. Assuring that the end item data required is adequate and accurate with the data package presented. A specific individual check shall be made of the work instructions, which is the Shipping Request Form and a Quality check list on each piece of data.

All discrepancies found between end item data, Shipping Request and/or the DD 250 shall be documented by the Reporting System Tag (Form NSD-16). All Reporting System Tags originated shall be forwarded to Quality Engineering to obtain proper disposition instructions and corrective action.

Q. D. 6.2
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Quality Control shall sign Shipping Request indicating acceptance of end item data.

3.3 Administration

Administration is to assemble end item data to the specific requirements of the applicable contract, and prepare the DD-250 Form assuring that it meets the required scheduling and shipment requirements.

3.4 Material Control

Material Control shall prepare end item data and technical data for shipment as specified on the Shipping Request Form.

Material Control shall maintain a file of all end item data shipments by serialized number on Shipping Request Form.

4. APPENDIX

4.1 Forms

(a) Material Inspection and Receiving Report - DD 250

(b) Shipping Request - Form P4

(c) Reporting System - NSD-16

**MATERIAL INSPECTION
AND
RECEIVING REPORT**

NC
DA

Q. D. 6.2
Page 4
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2. SHIPMENT NO. ●	3. DATE SHIPPED	4. B. L. TCM	5. DISCOUNT TER
----------------------	-----------------	-----------------	-----------------

PRIME CONTRACTOR Teledyne Isotopes, Inc. 110 W. Timonium Road Timonium, Maryland 21093	CODE	10. ADMINISTERED BY U. S. Atomic Energy Commission Space Nuclear Systems Division Washington, D. C. 20545	CODE
--	------	---	------

11. SHIPPED FROM (if other than 9) 110 W. Timonium Road Timonium, Maryland 21093	CODE	FOB:	12. PAYMENT WILL BE MADE BY	CODE
--	------	------	-----------------------------	------

13. SHIPPED TO Teledyne Isotopes, Inc. GFE Storage Area	CODE	14. MARKED FOR	CODE
---	------	----------------	------

15. ITEM NO.	16. STOCK/PART NO. (Indicate number of shipping containers - type of container - container number.)	17. QUANTITY SHIP. REC'D *	18. UNIT	19. UNIT PRICE	20. AMOUNT
1	Spare Fuel Capsule Simulator Heater P/N 452A6020029-009 (Fabricated to Revision C)	1	Ea.		

SAMPLE

21. PROCUREMENT QUALITY ASSURANCE		22. RECEIVER'S USE	
<input type="checkbox"/> POA <input checked="" type="checkbox"/> ACCEPTANCE of listed items has been made by me or under my supervision and they conform to contract, except as noted herein or on supporting documents. W. P. Thomas DATE: <u>3-14-74</u> SIGNATURE OF AUTH GOVT REP: <u>W. P. Thomas</u> TYPED NAME AND OFFICE: <u>Sandia Laboratory Division 9512 Albuquerque, N. M.</u>		<input type="checkbox"/> POA <input type="checkbox"/> ACCEPTANCE of listed items has been made by me or under my supervision and they conform to contract, except as noted herein or on supporting documents. DATE RECEIVED: _____ SIGNATURE OF AUTH GOVT REP: _____ TYPED NAME AND OFFICE: _____ * If quantity received by the Government is the same as quantity shipped, indicate by (✓) 1 mark, if different, enter actual quantity received below quantity shipped and encircle.	
23. CONTRACTOR USE ONLY 87115			

Account No.: 1-7222-607-30
Contract AT(19-15)-3069 (Formerly AT(29-2)-2960)
Reference Authorization: Modification No. 30 to Contract.

RECIPIENT:

Please complete Block 22 and forward one copy to the address shown in Block 10 and Sandia Laboratory, Division 9512, Albuquerque, New Mexico 87115.

W. P. Thomas 3-14-74



ISOTOPES

NUCLEAR SYSTEMS DIVISION
P.O. BOX 4937
EASTERN BLVD. at MARTIN BLVD., N.E.
MIDDLE RIVER, MARYLAND 21220
(301) 682-5800 TWX (710) 239-9037

Shipping

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Request

NOTE!! When returning or replacing this material, please reference S/R No. on all documents.

PART I (To be completed by originator)

A. Description of item (Include, Quantity, Model No.; Type, Serial No., and Gov't Property No.)

Ownership: Gov't Isotopes Leased

Purpose of Shipment:

- Return for credit — No replacement
- Return for rework or replacement at Vendor's expense
- Return for rework or replacement at Isotopes' expense.
- Furnished on consignment for use on P.O. No. _____
- Other (explain) _____

C. Comments or instructions to Vendor:

D. Control Data:

Vendor _____

P.O. No. _____

W.O./Acct. No. _____

Location of material _____

Ship no later than _____

Ship via _____ Collect
Prepaid

No. pcs./ctns. _____ Cu. Ft. _____

Weight _____ Est. Val. _____

PART II (To be completed by Shipping Dept.)

Actual method of shipment _____

Date shipped _____

Collect _____ Prepaid _____

FOB point _____

Waybill No. _____


Misc. _____

SHIP TO:

ATTN.:

GOVERNMENT PROPERTY	ORIGINATOR & TEL. EXT.	SUPERVISOR	PROPERTY ADMIN.	PURCHASING
ISOTOPES	ORIGINATOR & TEL. EXT.	SUPERVISOR	PROPERTY ADMIN.	PURCHASING

S/N 6919

ACCOUNT NO.	MANUFACTURER	DATE	FOLDER LIST NO.	 TELEDYNE ISOTOPES REPORTING SYSTEM
ITEM PART NO.	ITEM S/N	ITEM NAME	P. O. NO.	
NEXT ASSY PART NO.	NEXT ASSY S/N	NEXT ASSY NAME	INITIAL RPT NO.	

ITEM	TOTAL QTY	QTY DEFECT	DESCRIPTION OF EVENT

ACKNOWLEDGEMENT

QUALITY DEPARTMENT DISPOSITION INSTRUCTIONS	REPORTED BY	DATE
	QUALITY SUPERVISOR	
	QUALITY MANAGER	

	DISPOSITION APPROVAL	DATE
	QUALITY ENGINEER	
	QUALITY MANAGER	

INSTRUCTIONS FOR COMPLETING THIS FORM: AND FINAL ACCEPTANCE BLOCKS ON REVERSE SIDE OF HARD BACK COPY.

HSD-16 (5-71)

QUALITY DIRECTIVE

TITLE: STANDARDS AND CALIBRATION		
ORIGINATED BY: J. K. Wenderoth	DIRECTIVE NO. 7.1	REV. C
REVISED BY: C. W. Rowe	REVISION DATE 4-8-74	
REVIEWED BY: <i>C. W. Rowe</i>	ORIGINAL ISSUE DATE 7-10-69	
APPROVED: <i>W. A. McDonald 4/10/74</i>	PAGE 1 OF 9	

1. SCOPE

1.1 Summary

This directive defines a system for controlling the calibration of measurement and test equipment used for determination of product acceptability.

1.2 Purpose

To provide guidelines for the operation of a calibration program that will both insure conformance to contractual requirements and promote a high degree of accuracy in measurement and test data.

1.3 Reference

- a. Quality Procedure 7.0, "Standards and Calibration."
- b. Military Specification: "Calibration System Requirements," MIL-C-45662A, 1962

2. RESPONSIBILITIES

2.1 Quality Engineering

Quality Engineering will prepare and maintain an equipment listing defining all equipment requiring calibration and the applicable calibration interval.

2.2 Quality Control

Quality Control will be responsible for maintaining and calibrating, within the predetermined calibration interval, all equipment specified by Quality Engineering; maintaining measurement standards; and, maintaining documentation associated with the operation of the calibration system.

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2.3 Other Departments

All other departments will be responsible for verifying that new equipment under their cognizance is calibrated before use and for verifying that old equipment under their cognizance is within the stated calibration period.

3. REQUIREMENTS

3.1 Determination of Calibration Intervals

Quality Engineering will establish the calibration intervals for both existing and newly purchased equipment.

3.1.1 Calibration Cycles for Existing Equipment - The calibration intervals for existing equipment will be based on knowledge of equipment history and limitations, and review of vendor literature.

3.1.2 Calibration Cycles for New Equipment - Calibration requirements will be established upon receipt of new equipment and will be based on experience with similar equipment and vendor literature.

3.2 Adjustments to Established Calibration Cycles

Quality Control may alter the established calibration cycle for a specific piece of equipment with Quality Engineering approval, on the basis of the calibration history of that piece of equipment.

3.2.1 Increased Calibration - The calibration cycle for a piece of equipment may be shortened when that equipment has required adjustment during two consecutive calibrations.

3.2.2 Decreased Calibration - The calibration cycle for a piece of equipment may be lengthened when that equipment has completed four consecutive calibrations without an adjustment.

3.3 Recall System

Quality Control will establish and operate a recall system which will insure the timely calibration of all equipment.

3.3.1 Equipment History File - A card file (Fig. 1) will be maintained on each piece of equipment and will include, as a minimum, the required calibration dates and the calibration history of the equipment.

3.3.2 Recall Notification - A memorandum will be forwarded to the user of a piece of equipment before that equipment is due for calibration.

3.3.3 Overdue Notification - A memorandum will be written to the cognizant department head when equipment due for calibration is not turned in to Quality Control by the recall date.

3.4 Extension of Calibration Certification

Quality Engineering may extend an existing calibration certification for a period not to exceed two weeks. This extension will be granted in cases where there is a critical need for the particular piece of equipment and there is evidence that a calibration delay will not adversely affect the product.

3.5 Calibration Procedure

Quality Control will perform actual calibration of equipment or will assume responsibility for calibration at a recognized calibration laboratory. All calibration will be in accordance with the requirements of MIL-C-45662A.

Adequacy of Standards - Standards established by the contractor for calibrating the measuring and test equipment used in controlling product quality shall have the capabilities for accuracy, stability and range required for the intended use.

3.5.1 In-House Calibration - In-house calibration will be performed in accordance with standard calibration practices. Written procedure will be prepared and utilized for calibration of all measuring and test equipment and measurement standards used to assure the accuracy of measurements involved in establishing product conformance. Measuring and test equipment and measurement standards will be calibrated and utilized in an environment controlled to the extent necessary to assure continued measurements of required accuracy giving due consideration to temperature, humidity, vibration, cleanliness, and other controllable factors affecting precision measurement.

3.5.1.1 Upon completion of calibration, complete the equipment history card and affix a stamped calibration sticker (Fig. 2) to the equipment.

Equipment found to be out-of calibration is immediately brought to the attention of Quality Control. So that reinspection of material will be taken on all materials that may have been accepted by the equipment out-of calibration.

3.5.1.2 Calibrated mechanical equipment unused during a calibration cycle may be integrity inspected in lieu of recalibration.

3.5.2 Vendor Calibration - Equipment which cannot be calibrated in-house will be sent to an approved (by Quality Engineering) calibration laboratory.

3.5.2.1 An Equipment Service Request (ESR) tag (Fig. 3), signed by Quality Control, will be attached to the equipment requiring calibration.

3.5.2.2 A Work Release (Fig. 4) will be completed for each piece of equipment requiring calibration and will be forwarded to the calibrating agency.

3.5.2.3 Upon return of calibrated equipment, review calibration certificate for completion, sign Work Release and forward to Procurement, complete equipment history card, and assure that the equipment contains a valid calibration sticker.

3.5.3 Sealing of Calibrated Equipment - Calibrated equipment will be sealed (if reasonable) with a tamper-proof seal to prevent unauthorized entry/adjustment.

3.5.4 Calibration of Reference and Transfer Standards - A purchase requisition will be initiated to obtain calibration of standards. This purchase requisition will include the requirement for a certificate of compliance attesting to the date, accuracy, and conditions under which the results furnished were obtained. Calibration source-measuring and test equipment shall be calibrated utilizing reference standards whose calibration is certified as being traceable to the National Bureau of Standards.

3.6 Functional Checking of Equipment

Equipment that is not required to assure conformance of product but is necessary for overall efficient plant operation will be functionally checked upon request of the user.

3.7 Verification of Calibration Status

All users of measurement/test equipment will verify that the equipment is within calibration (as denoted by the attached sticker) and verify that the integrity seals are intact.

3.7.1 Out-of-Calibration/Malfunctioning Equipment - Out of calibration/malfunctioning equipment will be reported to Quality Control who will place an Out of Service (Fig. 5) tag on the equipment pending calibration or repair.

All out-of service equipment and equipment not in daily use with exception of large test equipment, consoles, etc., shall be segregated in specific equipment holding areas.

3.7.1.1. Product that has been manufactured/tested with discrepant equipment as noted above, will be documented on an RS tag for final disposition.

4. NOTES/APPENDIX

4.1 Figures

Figure 1 - Equipment Calibration History Card, Form 060306 (Rev. 1-64)

Figure 2 - Calibration Sticker, Form I-Q-401

Figure 3 - Equipment Service Request and Calibration Notice, Form TE-267 (1962)

Figure 4 - Work Release Form

Figure 5 - Out of Service Tag, Form I-M-303

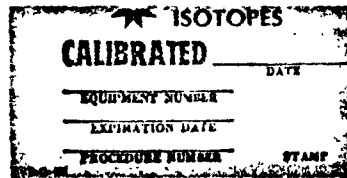


Figure 2

JOB NO. _____



EQUIPMENT SERVICE REQUEST AND CALIBRATION NOTICE

ACCOUNTABLE TO		NAME		PHONE	
DATE	EQUIP. NO.	EQUIPMENT NAME		JOB NO.	
EQUIP. MODEL NO.		EQUIPMENT MFR.		E. S. R. ORIGINATOR	
USING DEPT.	LOCATION	PHONE	SUPERVISOR	CALIB. DUE DATE	
CALIB. REQ'D	MAINT. REQ'D		EQUIP. PERFORMANCE NORMAL		
ACCOUNT NUMBER	CHARGED TO		NAME	BADGE	

DESCRIPTION OF MALFUNCTION _____

EQUIPMENT CONTROL CRIB

DATE RECD.	CRIB NO.	CRIB ATTENDANT			LOCATION	PHONE	
IMMED. CALIB. REQ'D		YES	NO	QUAL. SURV. REQ'D		YES	NO
EQUIP. COMPL.	LAST CHANGE		LTR.	TDD	PHYSICAL DAMAGE	YES	NO

CALIBRATION CENTER

DATE RECD.	WITHIN SPEC.	YES	NO	DATE COMPL.	NEXT CALIB. DUE	
TECHNICIAN		W. C.	EQUIPMENT CONDITION CODE			

CORRECTIVE ACTION TAKEN: _____

STAMP

ORIGINATOR

Figure 2

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ISOTOPES WORK RELEASE

PURCHASE ORDER

No:
THIS ORDER NUMBER MUST APPEAR ON
ALL CORRESPONDENCE, INVOICES,
PACKAGES AND SHIPPING PAPERS.

To:

Ship To:

Date:

SHIP VIA		F.O.B.	TERMS	DELIVERY REQUIRED	
QUANTITY	DESCRIPTION			PRICE	AMOUNT

By: _____

Figure 4

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OUT OF SERVICE

RECALIBRATE INSTRUMENTATION IN
ACCORDANCE WITH O/P NO. _____

BEFORE
RETURNING TO SERVICE



I-M-303 SIGNED

EXT.

DATE

Figure 5

QUALITY DIRECTIVE

TITLE: PROCUREMENT DOCUMENTS - QUALITY REQUIREMENTS		
ORIGINATED BY: W. E. White	DIRECTIVE NO. 8.1	REV. C
REVISED BY: W. R. Seetoo	REVISION DATE 2/4/76	
REVIEWED BY: 	ORIGINAL ISSUE DATE 2/18/71	
APPROVED: 	PAGE 1 OF 7	

1. SCOPE

1.1 Summary

This directive specifies the quality requirements that are applicable to the preparation of procurement documents to ensure the receipt of high quality materials.

1.2 Purpose

This directive is issued to define the procedures and documentation methods by which Quality personnel will review and approve procurement documents to insure compliance with contractual requirements.

2. RESPONSIBILITIES

2.1 Quality Engineering

Quality Engineering will review and sign all Purchase Requisitions (PR) ES-49 (10/75) (Figure 1).

3. REQUIREMENTS

3.1 Quality Engineering

Quality Engineering will, upon receipt of a Purchase Requisition:

3.1.1 Review - Review the requisition to determine whether there is sufficient information to order the required material(s). Such information will be obtained from drawings, specifications, parts lists, catalogs, etc.

3.1.2 Requirements - Determine the Quality requirements that are necessary to assure product conformance with the contract specifications, Teledyne Energy Systems specifications and applicable drawings, and make entries on the PR as defined below.

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- 3.1.2.1 Inspection requirements to be listed (if required):
- (a) Standard requirements as indicated on NQ-341 (Figure 2) "Quality Assurance Provisions of Purchase Orders."
 - (b) Additional requirements which are non-standard.
- 3.1.2.2 Enter in code blocks provided on PR the standard Quality requirements as indicated on NQ-341 (3/76), "Quality Assurance Provisions of Purchase Orders," as determined in 3.1.2. If N-9 (Quality Pre-Award Survey) is entered, Procurement shall not place the order until the survey is complete.
- 3.1.2.3 The "Insp Area" block will be coded "X" for "No Inspection Required" or "R" for "Receiving Inspection Required."
- 3.1.2.4 "Insp. Type" block will be coded "R" for Normal Receiving Inspection or "S" for Special Requirements and "X" for "No Inspection Required."
- 3.1.2.5 Specific detailed requirements not covered in Items 3.1.2.1 above will be noted in "Special Notes" block of PR.
- 3.1.2.6 When special or critical characteristics are to be checked and/or reported, such requirements shall be forwarded on Receiving Inspection Report (ES-42B) (Figure 3) as required, to Quality Control who shall attach the copy to the PO/PR package.
- 3.1.2.7 Sign and date PR in Quality Control block.
- 3.1.2.8 Send the Quality copy of the PR to Quality Control, coded for inspection requirements, and Quality Control shall file it in the Purchase Order Control file awaiting attachment to the PO.
- 3.1.2.9 Forward PR to Administration Department for signature and further processing.
- 3.2 Quality Control
- 3.2.1 Review of Purchase Order - Quality Control will, upon receipt of the Quality copy of the Purchase Order (ES-37) (Figure 4):
- 3.2.1.1 Remove copy of PR from Purchase Order Control File.
 - 3.2.1.2 Compare the PO with the PR to assure that PR inspection requirements are listed on the FO.
 - 3.2.1.3 Where a discrepancy affecting Quality exists between the PR and PO, return the PO to Procurement for correction.

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3.3 Quality Control/Receiving Inspection

3.3.1 File PR/PO - Quality Control will place the documents in numerical order by PO number in the Receiving Inspection Control file to await receipt of material from vendor.

4. NOTES/APPENDIX

4.1 Figures

Figure 1 - Purchase Requisition, ES-49

Figure 2 - Quality Assurance Provisions of Purchase Orders, NQ-341

Figure 3 - Receiving Inspection Report, ES-42B

Figure 4 - Purchase Order & Receiving Report (Lower Section), ES-37

4.2 Interface

This Quality Directive interfaces with the processing of procurement documents as defined in the Procurement Manual, Index numbers:

2.9 Requisition of Material

2.11 Purchase Request - Processing

2.12 Purchase Orders and Subcontracts

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 **TELEDYNE
ENERGY SYSTEMS**

QUALITY ASSURANCE PROVISIONS OF PURCHASE ORDERS

Buyer hereinafter shall mean Teledyne Energy Systems. Notwithstanding any other provisions, all articles furnished hereunder are subject to the Inspection Clause of the General Provisions of the Purchase Order and the following Special Inspection Clause(s) when indicated by clause number(s) in the schedule of the Purchase Order.

Articles defined in the schedule of the Purchase Order will not be accepted by Buyer if the Seller fails to submit certification, documentation, test data and reports specified herein.

- N-1 Energy Research & Development Admin'n**
Energy Research & Development Administration (ERDA) or their designated authority inspection is required prior to shipment from your plant. Three (3) copies of this contract have been furnished to the cognizant Government agency. These copies will be forwarded to the appropriate Government office having cognizance at your plant.
- N-2 Shipment to Buyer Contractor/Agency**
As material ordered hereunder is to be shipped direct to a Buyer designated contractor/agency, copies of the data required by this contract shall accompany the shipment and shall also be mailed to Buyer, "Attention: Quality Receiving Inspection" the same date the shipment is made.
- N-3 Certificate of Compliance**
A certificate or statement of material and process conformance is required covering the articles contracted for hereunder. This certificate or statement of conformance must stipulate that the items contracted for meet all drawings, specifications and other applicable documentation. An example of an acceptable certificate or statement of conformance is as follows:
"This is to certify that all items noted on Purchase Order Number XXXX are in conformance with the Contract Purchase Order, drawings, specifications and other applicable documentation."
This certificate or statement shall be validated by an authorized representative of the Seller's Quality Department or validated by a notary public. This certificate must be attached to the packing sheet and accompany each shipment to be delivered hereunder.

- N-4 Buyer Inspection at Destination**
Articles defined in the schedule of this contract are subject to Buyer Inspection at destination and will not be accepted by Buyer if the Seller fails to submit the certification, documentation, test data, and reports specified in the Contract.
- N-5 Source Inspection**
Buyer source inspection shall be conducted at the Seller's facilities or where designated in this Contract, prior to shipment. When the items are ready for inspection, or if practicable ten (10) days in advance thereof, notify the Buyer Quality Representative or the Buyer area Quality office.
Drawings and/or other pertinent data which may be required for adequate inspection shall be made available to the Quality representative.
- N-6 Chemical and Physical Test Reports**
Actual chemical and/or physical test reports, one (1) copy as required by specification for each lot, batch or heat, whichever is applicable, must be attached to the packing sheet and accompany each shipment to be delivered hereunder.
- N-7 Drawing Requirements**
Drawing or sketch and specification sufficient to inspect and/or test this material must accompany first shipment of this Contract and be attached to the packing sheet.
- N-8 Buyer Parts Procured to Seller Part Number**
Articles defined by Seller's part number in this Contract will be inspected by Buyer for conformance to the referenced Buyer specification.
- N-9 Quality Pre-Award Survey**
Buyer shall survey Seller's facility to evaluate Seller's capabilities. Evaluation shall include, but not be limited to, manufacturing equipment, inspection department, ability to meet schedules, personnel qualifications, etc. The survey may take place prior to actual fabrication, if delay of order placement jeopardizes schedule or cost (Pre-Fabrication Survey).

HQ-3/1 (3/76)



RECEIVING INSPECTION REPORT

Purchase Order No. _____

Report No. _____

Specifications	1	Req'd Certifications/Reports	6
Teledyne Part & Dash Number	2	Special Provisions of Receiver	7
Manufacturer's Part Number	3	Source Inspection Evidence	8
Manufacturer's Name/Trace Mark	4	Workmanship/Damage	9
Serialized Item	5	Sampling - Table No. _____	10

Instructions for completion of this report:
 The ten inspection characteristic blocks must be completed "YES" or "NO", inserted in the block following the numeral. All "YES" items will be supported by recording pertinent data in the field of this report. In addition, all inspection characteristics verified must be recorded - measurements, drawing notes, etc.

6. Verify that all certifications or data required by drawing, specifications or purchase order are received.

Review required certifications and data to assure conformance with requirements.

 Signature Date Stamp

PURCHASE ORDER & RECEIVING REPORT (LOWER SECTION)

PURCHASE ORDER

PAGE _____ OF _____

ENERGY SYSTEMS

110 W. TIMONIUM RD TIMONIUM, MD. 21093
PHONE: 301-252-8220 TELEX: 87-780 CABLE: TELISES

PURCHASE ORDER NO	DATE	AMENDMENT NO
ABOVE NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, PACKING SLIPS, CORRESPONDENCE, ETC INVOICE IN TRIPLICATE TO ACCOUNTING DEPT.		

TO

SHIP TO: TELEDYNE ENERGY SYSTEMS
110 W. TIMONIUM ROAD
TIMONIUM, MARYLAND 21093

PRIME CONTRACT NO	PRIORITY	TERMS	F.O.B.	TAX EXEMPT NO. A78190 <input type="checkbox"/> YES <input type="checkbox"/> NO	SHIP PREPAID VIA
SELLER'S SHIP DATE	REQ. DATE	INSPECTION	ORIGINATOR	ACCOUNT NO.	REQ'N NO.

ITEM NO	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
		Confirming telecon order of _____ to _____		
THE ATTACHED GENERAL PROVISIONS _____ IS APPLICABLE TO AND BECOMES PART OF THIS PURCHASE ORDER				

NOTICE FOLLOWING ARTICLES AND OR CODES ATTACHED ARE INCORPORATED IN THIS PURCHASE ORDER

PURCHASE ORDER VALUE →

BUYER: _____

RECEIVING AND INSPECTION REPORT

RPT. NO	ITEM	QUANTITY IN STOCK UNIT OF MEASURE					VENDOR U/M		DATE RCVD	WB NO	REMARKS
		RECEIVED	U/M	SAL. DUE	U/S	ACCEPTED	DEFECTED	RECD			

QUALITY DIRECTIVE

TITLE: EMPLOYEE SKILL CERTIFICATION		
ORIGINATED BY: W. J. Coleman	DIRECTIVE NO. 9.1	REV D
REVISED BY: A. M. Konjura	REVISION DATE 10/22/73	
REVIEWED BY: <i>R.P. Bunn</i>	ORIGINAL ISSUE DATE 2/16/70	
APPROVED: <i>G. E. Wood</i>	PAGE 1 OF 6	

1. SCOPE

1.1 Summary

This directive provides a system for employee skill certification.

1.2 Purpose

To identify the skills requiring certification, to establish a procedure for certifying employees, and to control the issuance of skill certification cards.

1.3 References

- a. Quality Procedure 9.0, "Manufacturing Process Control."

2. RESPONSIBILITIES

2.1 Quality Engineering

Quality Engineering shall establish and direct implementation of the employee skill certification program, and shall be responsible for maintaining the records associated with the operation of the skill certification program.

2.2 Quality Control

Quality Control shall be responsible for the identification of employees performing operations requiring skill certifications and shall monitor the preparation of samples when required in the certification program.

2.3 Personnel

Personnel shall arrange to have vision tests administered to those employees specified by Quality Engineering.

2.4 Engineering/Manufacturing

Engineering and/or Manufacturing shall be responsible for identifying those processes which require the use of a certified operator in the applicable drawing and/or process specification.

2.5 Department Supervisor

Each department supervisor having certified personnel reporting to him shall be responsible for maintaining cognizance of employee workmanship and activity in the certified skill; and shall participate in a semi-annual review of employee certifications with Quality Engineering.

3. REQUIREMENTS**3.1 Quality Engineering****3.1.1 Skill Certification Requirements - Establish requirements (see Figure 1) for obtaining initial skill certification which may include some or all of the following:**

- a. On the job training
- b. Preparation of sample specimens
- c. Completion of written examination
- d. Vision test

3.1.1.1 Define type and number of sample specimens required and evaluate their acceptability upon completion.

3.1.1.2 Prepare required written examinations and evaluate results.

3.1.1.3 Arrange in coordination with the Personnel Department for the completion of necessary vision tests.

3.1.2 Recertification Requirements - Monitor operations to determine need for recertification based on any of the following:

- a. Poor workmanship
- b. Initiation of new methods
- c. Inactivity in excess of six months

3.1.2.1 Periodically review work status of certified employees with their Supervisor to determine if inactivity limits have been exceeded and if acceptable workmanship levels have been maintained.

3.1.2.2 Review new and/or revised process specifications for possible changes affecting skill certifications.

3.1.3 Skill Certification Cards - Issue skill certification cards (see Figure 2) to those employees who have successfully completed the certification requirements of a particular skill.

3.1.4 Periodic Certification Review - Review employee skill certification and update status at six month intervals (see Figure 3).

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- 3.1.5 Certification Records - Maintain records of the skill certification status of employees.
- 3.2 Quality Control
- 3.2.1 Requests for Certification - Submit requests for employee certifications to Quality Engineering.
- 3.2.2 Preparation of Samples - Monitor preparation of sample specimens for certification tests when directed by Quality Engineering.
- 3.2.3 Workmanship - Report incidences of poor workmanship to Quality Engineering.

4. NOTES APPENDIX

4.1 Figures

- Figure 1 - Employee Skill Certification Requirements
- Figure 2 - Teledyne Isotopes Certificate of Qualification
- Figure 3 - Employee Skill Certification Review Record

Skill Title	Skill No.	Certification Requirements	Recertification Requirements (Semi-Annual)
Packing Insulation	TI-01	1. On-the-job training 2. Sample Specimens 3. Written Examination	Supervisor & Quality Engineering Review
Welding	TI-02	1. On-the-job training 2. Sample Specimens 3. Vision Test	Supervisor & Quality Engineering Review Sample Specimens
Potting	TI-03	1. On-the-job training 2. Sample Specimens 3. Written Examination	Supervisor & Quality Engineering Review
Crimping	TI-04	1. On-the-job training 2. Sample Specimens 3. Written Examination 4. Vision Test	Supervisor & Quality Engineering Review
Soldering	TI-05	1. On-the-job training 2. Sample Specimens 3. Written Examination 4. Vision Test	Supervisor & Quality Engineering Review
Penetrant Inspection	TI-06	1. On-the-job training 2. Written Examination 3. Vision Test	Supervisor & Quality Engineering Review
Soldering Inspection	TI-07	1. On-the-job training 2. Written Examination 3. Vision Test	Supervisor & Quality Engineering Review
Radiographic Inspection	TI-08	1. On-the-job training 2. Written Examination 3. Vision Test	Supervisor & Quality Engineering Review
Welding Inspector	TI-09	1. On-the-job training 2. Written Examination 3. Vision Test	Supervisor & Quality Engineering Review
Helium Leak Detector Operation	TI-10	1. On-the-job training 2. Written Examination	Supervisor & Quality Engineering Review

NOTE: Employees holding certifications which require vision tests will be tested at yearly intervals.

Fig. 1. Employee Skill Certification Requirements

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TELEDYNE ISOTOPES
CERTIFICATE OF QUALIFICATION

NO GLASSES ARE REQUIRED - SPECIFY HERE

THIS IS TO CERTIFY THAT

HAS SUCCESSFULLY COMPLETED REQUIREMENTS AS PRESCRIBED BY SPECIFICATION AND OR CERTIFICATION TEST FORM AND IS QUALIFIED TO PERFORM THE SPECIFIED SKILLS AS INDICATED HEREON.

SIGNATURE OF CERTIFIED PERSONNEL

SEE QUALITY OBJECTIVE 6.000 FOR CERTIFICATION PROCEDURE

(SKILL TITLE)

SPECIFICATION OR CERTIFICATION TEST FORM NO. _____
RE-CERTIFICATION DATE EVERY _____

DATE AUTHORIZED REPRESENTATIVE SIGNATURE

(SKILL TITLE)

SPECIFICATION OR CERTIFICATION TEST FORM NO. _____
RE-CERTIFICATION DATE EVERY _____

DATE AUTHORIZED REPRESENTATIVE SIGNATURE

Fig. 2. Teledyne Isotopes Certificate of Qualification

EMPLOYEE SKILL CERTIFICATION REVIEW RECORD

EMPLOYEE NAME _____

SKILL TITLE AND NUMBER	ACTIVE IN SKILL IN PRECEDING 6 MOS.		SATISFACTORY WORKMANSHIP		COMMENTS	DEPT SUPERVISOR RESPONSIBLE FOR REVIEW	QUALITY ENGINEERING ACKNOWLEDGEMENT	DATE
	YES	NO	YES	NO				

Fig. 3. Employee Skill Certification Review Record

Q.D. 9.1D
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 10/22/73

TITLE: INSPECTION STAMPS		
ORIGINATED BY: C. W. Rowe	DIRECTIVE NO 10.1	REV C
REVISED BY: J. K. Wenderoth	REVISION DATE 1/27/76	
REVIEWED BY: <i>C. W. Rowe</i>	ORIGINAL ISSUE DATE 11/17/69	
APPROVED: <i>W. A. McDonald</i>	PAGE 1 OF 3	

1. SCOPE

1.1 Summary

This document defines the system for procurement, issuance, control, use, and return of inspection stamps.

1.2 Purpose

To provide a method that assures the proper usage of inspection stamps by qualified Quality Department personnel.

1.3 Reference

- a. Quality Procedure 10.0, "Quality Stamps"

2. RESPONSIBILITIES2.1 Quality Engineering

Quality Engineering is responsible for the control of stamp design, purchase, and issuance.

2.2 Quality Control

Quality Control is responsible for the proper care and use of issued stamps.

3. REQUIREMENTS3.1 Quality Engineering

- 3.1.1 Procurement of Stamps - Upon receipt of request for a new or revised stamp, review with Quality Manager for approval. Prepare purchase requisition, including stamp design, for new stamp requirement. Follow up for receipt of stamps and deliver to Quality Engineering Supervisor.

NOTE: Stamp design must not conflict with the design of other company issued stamps and they shall not contain customer designations.

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- 3.1.2 Issuance - Issue new or replacement stamps to qualified personnel. Maintain distribution control; list stamps by type, serial number and personnel to whom assigned.
- 3.1.3 Return - Receive stamps returned by Inspectors due to termination, stamp deterioration, etc. Assure return when need no longer exists.
 - 3.1.3.1 Immediately confiscate and destroy stamps in deteriorated condition.
 - 3.1.3.2 Hold useable stamps for six month period before reissuance.
- 3.2 Quality Control
 - 3.2.1 Request for Stamps - The Quality Control Supervisor shall notify Quality Engineering of any need for a new stamp or revision to an existing stamp, noting the purpose for the stamp.
 - 3.2.2 Care of Stamps - Quality Control shall exercise care to prevent loss of stamp to preclude unauthorized or improper use by any person other than assignee.
 - 3.2.2.1 Maintain stamps so as to provide legible markings or impressions when affixed to articles or documentation.
 - 3.2.2.2 Use black ink for stamping documents.
 - 3.2.2.3 Notify Supervisor immediately if a stamp is lost or if unauthorized use of a stamp is suspected.
 - 3.2.3 Instructions for Use of Stamps - Use assigned personal stamp to identify acceptance/status of material or articles which have undergone source or receiving inspection, in-process inspection, end item inspection, testing, storage or shipment, and to validate calibration records and seals.
 - 3.2.3.1 For non-logged items, stamps may be applied directly to articles or materials except when this is impractical due to physical limitation or when such application will compromise their quality. In such cases, stamps shall be applied to identification tags or labels attached to articles or their containers.
 - 3.2.3.2 When a stamp is used to indicate acceptance of a test on a non-logged item, note the test and any applicable test result adjacent to the stamp on the identification tag (i.e., hardness check, penetrant inspection, leak test, etc.).
 - 3.2.3.3 For logged items, stamps shall be affixed in the appropriate block for the inspection step performed.

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3.2.3.4 An Inspector shall, when necessary, void his original stamp by writing "VOID" across the face of stamp. The Quality Control Supervisor will be contacted if other inspectors' stamps require cancellation.

3.3 Types of Stamps

3.3.1 Rubber - Used to stamp material or parts when use will not be harmful to stamped article, and to stamp documents or forms, decals, torque markings, calibration records, seals, etc.

3.3.2 Impression - Used to stamp lead seals, parts when permissible, and tools.



APPENDIX II

NON-DESTRUCTIVE TEST PLAN

I. Scope

This plan covers the non-destructive testing and inspection methodology for critical components within the SIG Program. It is structured along the basic organizational format of MIL-I-6870D.

II. Applicability

This plan shall apply to both development and flight hardware as appropriate and when their design requires non-destructive testing or inspection for acceptance.

III. Requirements

A. Preparation of Non-destructive Requisites - Quality Engineering will review overall systems, assemblies and components for definition of non-destructive methods, applicability and need. The program FMECA will be utilized as a guide in ascertaining the degree of NDT/NDI to be applied to various characteristics (Category I and II as defined in the FMECA will be given top priority). Requisites for NDT/NDI will be defined by Quality Engineering and incorporated within the engineering drawing or specification whenever possible. Separate NDT/NDI requisites will be prepared as distinct plans only in those instances where detailed requirements are too involved and/or intricate for incorporation within the basic design documentation.

B. Objective - This plan and resultant NDT/NDI requirements have as their objective the assurance of a level of non-destructive testing or inspection which will achieve a confidence in product quality consistent with design requirements. Furthermore, the achievement of this objective will:

1. Prevent or minimize "down-stream" problems by appropriate NDT/NDI planning during the initial design phase.
2. Assure a level of product quality consistent with reliability criteria.

C. Applicability - This plan is applicable to all components of the generator as defined in Section II above.

IV. Preparation of NDT/NDI Procedures and Process Specifications

- A. Company (TES) Specifications - When required, company specifications shall be prepared incorporating the requirements of standard NDT/NDI process specifications as well as supplying detailed information necessary to satisfy or exceed these same standard specifications. These company specifications shall use the particular equipment, personnel and test facilities required to meet the reliability requirements of the product. If no general process specification exists for a particular method a company process specification shall incorporate sufficient information and criteria to adequately describe the NDI method and control the process.
- B. Standard NDT/NDI Process Specifications - Standard procedures to inspect designated components may be used to supplement company process specifications.
- C. Standardization - The company (TES) specification shall reflect procedures and records to assure adequate quality assurance methods are being enforced to keep the NDT/NDI process in control. Basic process, equipment, materials and technique variables as applicable shall be monitored to assure adequate control of the inspection process.
- D. Subcontractor Control - Subcontractors will be required to perform NDT/NDI in accordance with procedures developed or approved by the contractor. Methods and equipment shall be subject to contractor approval.

V. NDT/NDI Procedures

NDT/NDI procedures will be provided where required for inspection of key or critical generator components. These procedures shall be in accordance with the requirements of the engineering drawings, company (TES) process and material specifications and shall include the information listed below:

- a. Specification part and/or drawing number.
- b. Surface finish and/or part preparation, as applicable.
- c. Manufacturer and model number of all instrumentation to be used.
- d. Fixturing and tooling requirements, as applicable.
- e. Manufacturer and identification of required inspection equipment.

- f. Reference to applicable process and/or material specifications (TES).
- g. Calibration/standardization procedure and reference standard identify, as applicable.
- h. Identification of areas to be inspected, detailed steps and level of inspector qualification required, description of probable defects, maximum acceptable defect size, location and most critical orientation.
- i. Identifiable precautions in use of the inspection procedure.

If the NDT/NDI is performed by purposes other than flaw detection, the procedure shall be specifically written to accommodate the test purpose.

VI. Implementation of NDT/NDI Procedures

- A. Personnel - The NDT/NDI facility shall have available, records of certification for personnel conducting and interpreting non-destructive inspections in accordance with the applicable sections of MIL-STD-410, ASNT-TC-1A or other methods in conformance with contractual requirements and reviewed by DOE.
- B. NDT/NDI Reports - NDT/NDI reports and/or data records shall be kept on file unless otherwise specified. Reports shall be signed or stamped identified by an authorized representative of the inspection facility.
- C. Equipment and Materials - The equipment and materials used for inspection shall be in accordance with the applicable approved company (TES) specifications. Specified equipment shall have adequate maintenance to assure that it is fully operational when used to conduct inspections.
- D. NDT/NDI Procedure Verification - All procedures shall be verified to assure repeatable defect sensitivity sufficient for classification of the part. Procedures may be verified on parts or on test pieces simulating the actual part and which provide the essential features of the part with regard to the important application variables which may affect defect sensitivity and confidence level. Redundant inspections may be utilized.

- f. Reference to applicable process and/or material specifications (TES).
- g. Calibration/standardization procedure and reference standard identity, as applicable.
- h. Identification of areas to be inspected, detailed steps and level of inspector qualification required, description of probable defects, maximum acceptable defect size, location and most critical orientation.
- i. Identifiable precautions in use of the inspection procedure.

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- A. Personnel - The NDT/NDI facility shall have available, records of certification for personnel conducting and interpreting nondestructive inspections in accordance with the applicable sections of MIL-STD-410 or other methods in conformance with contractual requirements.
- B. NDT/NDI Reports - NDT/NDI reports and/or data records shall be kept on file unless otherwise specified. Reports shall be signed or stamped identified by an authorized representative of the inspection facility.
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- D. NDT/NDI Procedure Verification - All procedures shall be verified to assure repeatable defect sensitivity sufficient for classification of the part. Procedures may be verified on parts or on test pieces simulating the actual part and which provide the essential features of the part with regard to the important application variables which may affect defect sensitivity and confidence level. Redundant inspections may be utilized.

APPENDIX III. EXCEPTIONS AND/OR MODIFICATIONS TO NRA-1 REQUIREMENTS

INTRODUCTORY REMARKS

In accordance with the requirements of NRA-1, Para. 2.3, to wit: "Recognizing that all requirements of this document do not apply to all programs, the contractor shall include in his Quality Program Plan submittal those elements which are believed to be applicable, and recommend with explanation the modification or elimination of elements which are not believed to be applicable." The following listing (by NRA-1 paragraph number) indicates exclusions intrinsic to this Quality Plan.

<u>Para.</u>	<u>Modification or Exception</u>	<u>Explanation</u>
1.2	Test Instrumentation and Fixturing	Non-deliverable items used strictly for test monitoring or test measurement or test configuration do not require application of this plan.
1.3	Exceptions to NRA-1	All requirements of NRA-1 are not adhered to as evidenced in this Appendix.
1.4	Supplier Proprietary Processes	Limitation of contractual agreements with suppliers and subcontractors.
2.3	Interfaces as defined in 2.3.1.4	Interface relationships are covered in other programmatic documents.
2.7.2	Process control and Quality trend summaries	Not all component and assembly manufacture lend themselves to meaningful trend or control summarization.
2.7.3	Quality Trend Summaries	Same as 2.7.2
2.7.4.1	Audit of all phases of Quality Program every 12 months and unscheduled audits	Current audit scheduling and planning has proven adequate for proper control and monitoring.
2.7.4.2	Quality assurance review meetings	Sufficient quality visibility is obtained through other types of meetings to preclude the necessity of separate and distinct Quality meetings.
3.2	Quality assurance procedures for safety requirements	Safety requirements are incorporated within applicable Engineering and Manufacturing specifications.
3.4	Removal of obsolete documents.	Informal procedures exist for selected areas only.

<u>Para.</u>	<u>Modification or Exception</u>	<u>Explanation</u>
5.3.1	Document Reviews (Procurement)	Documentation of the review is only to the extent indicated on the Purchase Requisition or its attachments. Copies of these are maintained for comparison to copies of released Purchase Orders when available. Purchase Orders are not reviewed prior to release.
5.3.2	Proprietary Processes and Sole Sources	Negotiation with sole-source or limited quantity suppliers or suppliers with proprietary processes may be a limiting restriction on detailed Quality requirements.
6.1	a) Safety Assurance Monitoring Points	Not included in Quality procedures since they are incorporated in Engineering and Manufacturing drawings and specifications.
	b) Separate sequencing procedures	Sequencing and scheduling of tasks are incorporated within applicable drawings and/or specifications.
6.3	a) Process flow charts	Not utilized since lot sizes are limited and not suitable for extensive flow analysis
	b) Tooling items	Not necessarily identified in planning documentation or inspected at prescribed intervals (exceptions are tooling items which provide basis for product acceptance).
6.4	Qualification and First Articles	Process qualification through use of first article may be due to process requirements (expense, duration) which require first article to be production unit.
7.1	Safety assurance monitoring points	Same as 6.1.
7.2.4	Rehearsal	Quality will not necessarily take part in rehearsal, nor will the initial rehearsal necessarily come under Government surveillance.
8.3.2	Recommendations to Govern- ment representative	Submitted to on-site DOE representative not DOE Contracting Officer.

<u>Para.</u>	<u>Modification or Exeption</u>	<u>Explanation</u>
8.3.3	MRB Disposition	CAB recognizes a disposition "restricted usage".
8.4.1	Summary of Non-Conformances	A Corrective Action Status Report is issued in place of a summary. It is a listing of open items - not a summary.
8.4.2	Extension of Corrective Action System to sub-contractors and suppliers	It is a function of interface agreements in effect during contractual period.
8.4.3	Quality Trend Visibility	Statistical analysis would not provide meaningful or useful data. Quality trend summaries will be provided when appropriate.
9.3	Leak Test Calibration	TES employs special leak test calibration equipment - not traceable to national standards.
10.1	Qualifications, training and prerogatives	Training and qualification and prerogatives are not documented outside of special skills and associated certificate and testing.
12.1	Sampling Plan submittal	Only sampling plans other than those contained in Q. D. 4.1 will be submitted for DOE approval.
12.2	Exception to all requirements other than destructive testing as necessary	Normal manufacturing procedures and quantities do not lend themselves to detailed control analysis.

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APPENDIX IV

FAILURE REVIEW BOARD
(TBD)

TES-2865-13

APPENDIX V
QUALITY MANUAL REVISION CONTROL INDEX

ISOTOPES

REVISION J DATE 6/30/78

1. PURPOSE - The purpose of this Revision Control Index is to provide a means of controlling changes to the Quality Manual and to indicate the present status of the documents in the manual
2. POSTING Personnel posting this Index and Revisions thereto should read and take note of any changes in the new or revised document before posting. Quality Personnel, only, are required to initial the 'Read By' block
3. USE - This Index shall be replaced whenever a new Index is published and posted. All documents kept in the Manual shall agree with the latest posted Revision Control Index and the Revisions posted therein. Missing or revised documents can be obtained from Quality Engineering

THIS INDEX POSTED BY _____ DATE POSTED _____

LISTING OF CURRENT DOCUMENTS _ _ _ _ _ New or Revised are noted by (*)

Procedure or Directive No	REV	Revision Date	Title	Posted By	Read By
1.1	B	11/22/72	Preparation of Quality Directives		
2.1	C	11/22/72	Configuration Control		
2.2	B	5/01/72	Review of Technical Documents		
3.2	A	2/28/73	Control of GFE		
3.3	B	5/01/72	Teledyne Isotopes Reporting System		
3.4	C	9/05/74	Quality Control of Energy Systems Division Fabrication Material		
3.5	C	5/01/72	Handling of Scrap and Salvage Hardware		
3.6	B	5/01/72	Quality Control of Procured Material		
3.7 *	C	6/16/78	Corrective Action Board System		
4.1	A	5/01/72	Inspection Sampling Plan		
4.002		11/02/70	X-Ray Sampling of Electronic Components		
4.3	B	8/23/72	Sampling Plans for Acceptance Testing of 2N T/E Elements		
4.4	B	8/16/72	Sampling Plans for Acceptance Testing TAGS 85 P Type T/E Elements		
4.5	A	11/07/72	Sampling Plans for Acceptance Testing of 2N-Tags T/E Couples		
5.001		9/08/70	Evaluation of Plant Capabilities		
5.3	A	5/01/72	Periodic Internal Quality Audits		

LISTING OF CURRENT DOCUMENTS

New or Revised are noted by (*)

Procedure or Directive No.	REV	Revision Date	Title	Posted By	Read By
5.4	A	12/08/71	Utilization of Liaison Call Sheet		
5.5	A	5/01/72	Quality Planning Documentation		
6.1	A	1/31/73	Quality Trend Reporting		
6.2		4/08/74	End Item Data Control		
7.1	C	4/08/74	Standards and Calibration		
8.1	C	2/04/76	Procurement Documents - Quality Requirements		
9.1	D	10/22/73	Employee Skill Certification		
10.1	C	1/27/76	Inspection Stamps		
11.1		12/23/74	Quality Control of ASME Code Welds		