1.0 Purpose

This document describes the quality assurance program of UNC Recovery Systems (UNC-RS) for the procurement, inspection and use of shipping containers for radioactive materials, in compliance with 10CFR71.51.

2.0 Scope

The application of this program is limited to the extent of the requirements of 10CFR71.51 and Appendix E to 10CFR71. Only unirradiated uranium-bearing special nuclear material, source material or small sealed radioactive sources are involved in shipments by UNC-RS. Packages and conditions for shipment of irradiated fuel, high level waste and plutonium are specificaly excluded. Based on the simplicity of the standard design containers used by UNC-RS, and their significant record of acceptable fabrication and safe use, this program does not involve extensive use of formal, detailed procedures in providing the degree of quality assurance necessary for compliance.

3.0 Organization

3.1 Corporate Organization

UNC's management structure for shipment of radioactive material begins at the division level and, therefore, no corporate organization is presented.

The General Manager reports directly to corporate management and is responsible for all activities at UNC-RS.

3.2 Site Organization

The General Manager for UNC-RS is responsible for the overall management of the plant. The Manager, Quality Assurance (QA) reports directly to the General Manager and is responsible for the planning, administration, and control of quality assurance programs for UNC-RS. He has the responsibility and authority, delineated in writing, to stop work in any aspect of the operation which is not in compliance with the Quality Assurance program.

An organization chart depicting the management structure for UNC-RS, designed specifically to identify all the units which have responsibilities associated with quality assurance programs, is shown in Figure 1.1. This organization structure provides the separation of functions and independence of actions necessary for proper quality assurance. Figure 1.2 describes the

functions normally performed by each operational unit, relative to this QA Program. Although aspects of this program may be delegated to other organizations or individuals, UNC-RS retains and exercises overall responsibility.

4.0 Quality Assurance Program

Quality Assurance comprises all necessary actions to provide adequate confidence that a transportation package will perform satisfactorily in service. The UNC-RS QA Program insures that a package and its use have the reliability for which the safety and performance of the package were evaluated.

4.1 Management Assessment

UNC-RS management, independent of the Quality Assurance Department, regularly assesses the scope, status, implementation, and effectiveness of the QA Program to assure that it is adequate and complies with 10CFR Part 71, Appendix E criteria.

4.2 QA Manual Control

Any QA manuals prepared in support of this QA Program shall have controlled distribution. Revisions thereto shall similarly be controlled.

4.3 QA Program Implementation

Provisions are established for communicating to all responsible organizations and individuals that quality policies, QA manuals, and procedures are mandatory requirements which must be implemented and enforced.

4.4 QA Program Applicability

This program is applicable to all radioactive material shipping containers and shipments, except those which are exempt under the provisions of 49CFR.

4.5 Resolution of Disputes

Disputes involving quality, arising from a difference of opinion between QA personnel and other departments shall be resolved in such a manner as to assure compliance with safety and regulatory requirements.

4.6 Indoctrination and Training

Personnel performing quality-related activities are provided with indoctrination and training to the degree necessary to assure an adequate level of knowledge and proficiency. When deemed necessary, such personnel are retrained in those activities wherein weakness has been detected.

4.7 Performance of Quality-Related Activities

When specified by procedure, quality related activities are performed with specified equipment under suitable environmental conditions. Specified prerequisites are satisfied prior to inspection and test.

5.0 Design Control

Under normal conditions, UNC-RS uses only standard design D.O.T. approved containers or is a registered user of USNRC approved containers. Therefore, this section of 10CFR71, Appendix E is not applicable. Should UNC-RS become involved in the design of radioactive material shipping containers, the following items will be implemented.

5.1 Design Activities

Measures will be established to carry out design activities in a planned, controlled, and orderly manner.

5.2 Requirements Translation

Measures will be established to correctly translate the applicable regulatory requirements and design bases into specifications, drawings, written procedures, and instructions.

5.3 Specification of Quality Standards

Quality standards will be specified in the design documents, and deviations and changes from these quality standards will be controlled.

5.4 Design Review

Designs will be reviewed to assure that (1) design characteristics can be controlled, inspected and tested and (2) inspection and test criteria are identified.

5.5 Design Verification

Proper selection and accomplishment of design verification or checking processes such as by design reviews, alternate calculations, or qualification testing will be performed. When a test program is used to verify the adequacy of a design, a qualification test of a prototype unit under design conditions will be used.

Individuals or groups responsible for design verification will be other than the original designer and the designer's immediate supervisor.

Positions or groups responsible for design reviews and other design verification activities and their authority and responsibility will be identified and controlled by written documents.

6.0 Procurement Document Control

To the extent necessary, UNC-RS will implement the following aspects of procurement document control. Under normal operating conditions, UNC-RS procurement of shipping containers is limited to D.O.T. 17-H's and 6-M's (55 gallon drums), and only minor aspects of procurement document control are required.

6.1 Procedures

Procedures are established that delineate the sequence of actions to be accomplished in the preparation, review, approval and control of procurement documents.

6.2 Procurement Document Contents

Documents for the procurement of radioactive material shipping containers will include or reference the following information, when applicable.

6.2.1 The applicable 10CFR Part 71, Appendix E requirements which must be complied with and described in the supplier's QA program.

6.2.2 The design basis technical requirements including the applicable regulatory requirements, material and component identification requirements, drawings, specifications, codes and industrial standards, test and inspection requirements, and special process instructions.

6.2.3 The documentation (e.g., drawings, specifications, procedures, inspection and fabrication plans, inspection and test records, personnel and procedures qualifications, and chemical and physical test results of material) to be prepared, maintained, and submitted to UNC-RS for review and approval.

6.2.4 Identification of those records to be retained, controlled, and maintained by the supplier, and those delivered to UNC-RS prior to use or installation of the hardware.

6.2.5 UNC-RS's right of access to supplier's facilities and records for source inspection and audit.

6.3 Procurement Document Revision

Changes and revisions to procurement documents are subject to at least the same review and approval as the original document.

7.0 Instructions, Procedures, and Drawings

When considered applicable by UNC-RS, the following items are implemented.

7.1 Activities Affecting Quality

Activities affecting quality are prescribed and accomplished in accordance with documented instructions, procedures, or drawings.

7.2 Sequence of Actions

Provisions are established which clearly delineate the sequence of actions to be accomplished in the preparation, review, approval, and control of instructions, procedures, and drawings.

7.3 Quality Assurance Reviews

Quality Assurance reviews and concurs with inspection plans; test, calibration, and special process procedures; drawings and specifications; and changes thereto.

8.0 Document Control

UNC-RS will implement the following items when such action is considered to be applicable and appropriate.

8.1 Document Adequacy

The review, approval, and issue of documents and changes thereto, prior to release, are procedurally controlled to assure they are adequate and the quality requirements are stated.

8.2 Change Review and Implementation

Changes to documents are reviewed and approved by the same organizations that performed the original review and approval or by other qualified responsible organizations delegated by the applicant.

Approved changes are included in instructions, procedures, drawings, and other documents prior to implementation of the change.

8.3 Document Availability

Documents are available at the location where the activity will be performed prior to commencing the work.

8.4 Document Master Lists

A master list, or equivalent, is established to identify the current revision number of instructions, procedures, specifications, drawings, and procurement documents.

9.0 Control of Purchased Materials, Parts and Components

UNC-RS determines the need for performance of the following activities, and implements them as needed.

9.1 Supplier Evaluation

9.1.1 Qualified personnel evaluate the supplier's capability to provide acceptable quality services and products.

9.1.2 The evaluation of suppliers is based on one or more of the following:

(1) The supplier's capability to comply with the elements of Appendix E to 10CFR Part 71 that are applicable to the type of material, equipment, or service being procured.

(2) A review of previous records and performance of suppliers who have provided similar articles of the type being procured.

(3) A survey of the supplier's facilities and QA program to determine his capability to supply a product which meets the design, manufacturing, and quality requirements.

9.1.3 The results of supplier evaluations are documented and filed.

9.2 Supplier Surveillance

If required, surveillance of suppliers during fabrication, inspection, testing, and shipment of materials, equipment and components is planned and performed in accordance with written procedures to assure conformance to the purchase order requirements.

9.3 Supplier Records

As a minimum, the supplier furnishes the following records to UNC-RS:

(1) Documentation that identifies the purchased material or equipment and the specific procurement requirements (e.g., codes, standards, and specifications) met by the items.

(2) Documentation that identifies any procurement requirements which have not been met together with a description of those nonconformances dispositioned "accept as is" or "repair".

9.4 Receiving Inspection

Receiving inspection of the supplier-furnished material, equipment, and services is performed to assure:

(1) The material, component, or equipment is properly identified and corresponds with the identification on receiving documentation.

(2) Material, components, equipment, and acceptance records are inspected and judged acceptable in accordance with predetermined inspection instructions, prior to installation or use.

(3) Inspection records or certificates of conformance attesting to the acceptance of material and components are available prior to installation or use.

(4) Items accepted and released are identified as to their inspection status prior to forwarding them to a controlled storage area or releasing them for further work.

10.0 Identification and Control of Materials, Parts, and Components

When considered necessary and applicable by UNC-RS, the following items are implemented.

10.1 Identification and Control Procedure

Procedures are established to identify and control materials, parts, and components including partially fabricated subassemblies.

The identification and control procedures assure that identification is maintained either on the item or on records traceable to the item to preclude use of incorrect or defective items.

10.2 Traceability

Identification of materials and parts important to the function of safety-related systems and components can be traced to the appropriate documentation such as drawings, specifications, purchase orders, manufacturing and inspection documents, deviation reports, and physical and chemical mill test reports.

10.3 Identification Location and Method

The location and the method of identification do not affect the fit, function, or quality of the item being identified.

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10.4 Verification and Documentation

Correct identification of materials, parts, and components is verified and documented prior to release for fabrication, assembling and installation.

11.0 Control of Special Processes

Special processes are controlled when such control is considered to be necessary to the proper functioning of the component.

11.1 Procedural Control

Special processes such as welding, heat treating, nondestructive testing, and cleaning are procedurally controlled.

11.2 Qualifications

Procedures, equipment, and personnel connected with special processes are qualified in accordance with applicable codes, standards, and specifications.

Qualification records of procedures, equipment, and personnel associated with special processes are established, filed, and kept current.

12.0 Inspection

UNC-RS reviews the need for the following inspection controls, and implements them as necessary and applicable.

12.1 Inspection Procedures

An inspection program which verifies conformance of quality-affecting activities with requirements is established, documented, and accomplished in accordance with written and controlled procedures.

12.2 Inspection Personnel

Inspection personnel are independent from the individuals performing the activity being inspected.

Inspectors are qualified in accordance with applicable codes, standards, and company training programs; and their qualifications and certifications are kept current.

12.3 Inspection of Modifications, Repairs, and Replacements

Modifications, repairs, and replacements are inspected in accordance with the original design and inspection requirements or acceptable alternatives.

12.4 Inspection Hold Points

Provisions are established that identify mandatory inspection hold points for witness by an inspector.

13.0 Test Control

When applicable, UNC-RS provides the following test controls.

13.1 Test Procedures

A test program to demonstrate that the item or component will perform satisfactorily in service is established, documented, and accomplished in accordance with written controlled procedures.

13.2 Testing of Modifications, Repairs, and Replacements

Modifications, repairs, and replacements are tested in accordance with the original design and testing requirements or acceptable alternatives.

13.3 Test Results

Test results are documented, evaluated, and their acceptability determined by a qualified, responsible individual or group.

14.0 Control of Measuring and Test Equipment

When measurement and testing of shipping packages by UNC-RS is determined to be necessary, the following controls will be provided for.

14.1 Calibration

Measuring and test instruments are calibrated at specified intervals based on the required accuracy, purpose, degree of usage, stability characteristics, and other conditions affecting the measurement.

14.2 Identification and Traceability

Measuring and test equipment is identified and traceable to the calibration test data.

14.3 Validity of Previous Inspections

Measures are taken and documented to determine the validity of previous inspections performed when measuring and test equipment is found to be out of calibration.

14.4 Standards

Reference and transfer standards are traceable to nationally recognized standards; or, where national standards do not exist, provisions are established to document the basis for calibration.

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15.0 Handling, Storage, and Shipping

UNC-RS provides the following controls to the degree determined to be necessary and applicable.

15.1 Work and Inspection Instructions

Special handling, preservation, storage, cleaning, packaging, and shipping requirements are established and accomplished by qualified individuals in accordance with predetermined work and inspection instructions.

15.2 NRC and DOT Conditions

All conditions (operations, tests, inspections, specifications, etc.) of the NRC package approval and the U.S. Department of Transportation shipping requirements are satisfied prior to shipment.

15.3 Shipping Papers

All necessary shipping papers will be prepared, as required.

15.4 Shipment Monitoring

Departure, arrival time and destination of a package will be established and monitored to a degree consistent with the safe transportation of the package.

16.0 Inspection, Test, and Operating Status

When applicable, UNC-RS implements the following controls.

16.1 Identification of Status

Identification of the inspection, test, and operating status of packages and components is known by affected organizations.

16.2 Control of Status Indicators

The application and removal of inspection and welding stamps and status indicators such as tags, markings, labels, and stamps are procedurally controlled.

16.3 Control of Operational Bypasses

Bypassing of required inspections, tests, and other critical operations is procedurally controlled.

16.4 Status of Unacceptable Packages

The status of nonconforming, inoperative, or malfunctioning packages or components is identified to prevent inadvertent use.

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17.0 Nonconforming Material, Parts, or Components

UNC-PS will control nonconforming items by techniques suitable for assuring that they are not utilized until their acceptability is established and documented. Such techniques may include the following elements.

17.1 Procedural Controls

The identification, documentation, segregation, review disposition, and notification to affected organizations of nonconforming materials, parts, components, or services are procedurally controlled.

17.2 Documentation

Documentation identifies the nonconforming item; describes the nonconformance, the disposition of the nonconformance, and the inspection requirements; and includes signature approval of the disposition.

17.4 Segregation and Identification

Nonconforming items are segregated from acceptable items and identified as discrepant until properly dispositioned.

17.5 Acceptance of Rework and Repair

Acceptability of rework or repair of materials, parts, components and systems is verified by reinspecting and retesting the item as originally inspected and tested or by a method which is at least equal to the original inspection and testing method.

18.0 Corrective Action

When appropriate to the circumstances, UNC-RS takes the following steps relative to corrective action.

18.1 Corrective Action Evaluation

Evaluation of conditions adverse to quality (such as nonconformances, failures, malfunctions, deficiencies, deviations, and defective material and equipment) is conducted to determine the need for corrective action in accordance with established procedures.

18.2 Initiation of Corrective Action

Corrective action to protect against recurrence is initiated following the determination of a condition adverse to quality and the need for such action.

18.3 Follow-up Reviews

Follow-up reviews are conducted to verify proper implementation of corrective actions and to closeout the corrective action documentation.

19.0 Quality Assurance Records

Appropriate records will be kept by UNC-RS, as required elsewhere by this program, and maintained in a manner consistent with applicable regulatory requirements.

Sufficient records are maintained to provide documentary evidence of the quality and safety of items and the activities affecting quality and safety. When applicable, the following records and controls will be utilized.

19.1 Types of Records

QA records include operating logs; results of reviews, inspections, tests, audits, and material analyses; qualification of personnel, procedures, and equipment; and other documentation such as drawings, specifications, procurement documents, calibration procedures and reports; nonconformance reports; and corrective action reports.

19.2 Records Control and Retention

A list of the required records and their storage locations will be maintained. The records will be identifiable and retrievable.

Design related records (e.g., drawings, calculations, etc.) are maintained for the life of the shipping package and all other records are maintained for a minimum of two years.

19.3 Contents of Inspection and Test Records

Inspection and test records contain the following where applicable:

(1) A description of the type of observation.

(2) Evidence of completing and verifying a manufacturing, inspection, or test operation.

(3) The date and results of the inspection or test.

(4) Information related to conditions adverse to quality.

(5) Inspector or data recorder identification.

(6) Evidence as to the acceptability of the results.

20.0 Audits

Audits will be carried out by UNC-RS to verify compliance with all aspects of this Quality Assurance Program and to determine the effectiveness of the program. Elements of these audits include the following.

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20.1 Audit Performance

Audits are performed in accordance with preestablished written procedures or check lists and conducted by personnel not having direct responsibilities in the areas being audited.

20.2 Documentation, Review, and Corrective Action

Audit results are documented and then reviewed with management having responsibility in the area audited. Responsible management then takes the necessary action to correct the deficiencies revealed by the audit.

20.3 Reauditing

Deficient areas are reaudited on a timely basis to verify implementation of corrective actions which minimize recurrence of deficiencies.

20.4 Audit Frequency

Audits of the QA program are perfomed at least annually based on the safety significance of the activity being audited.

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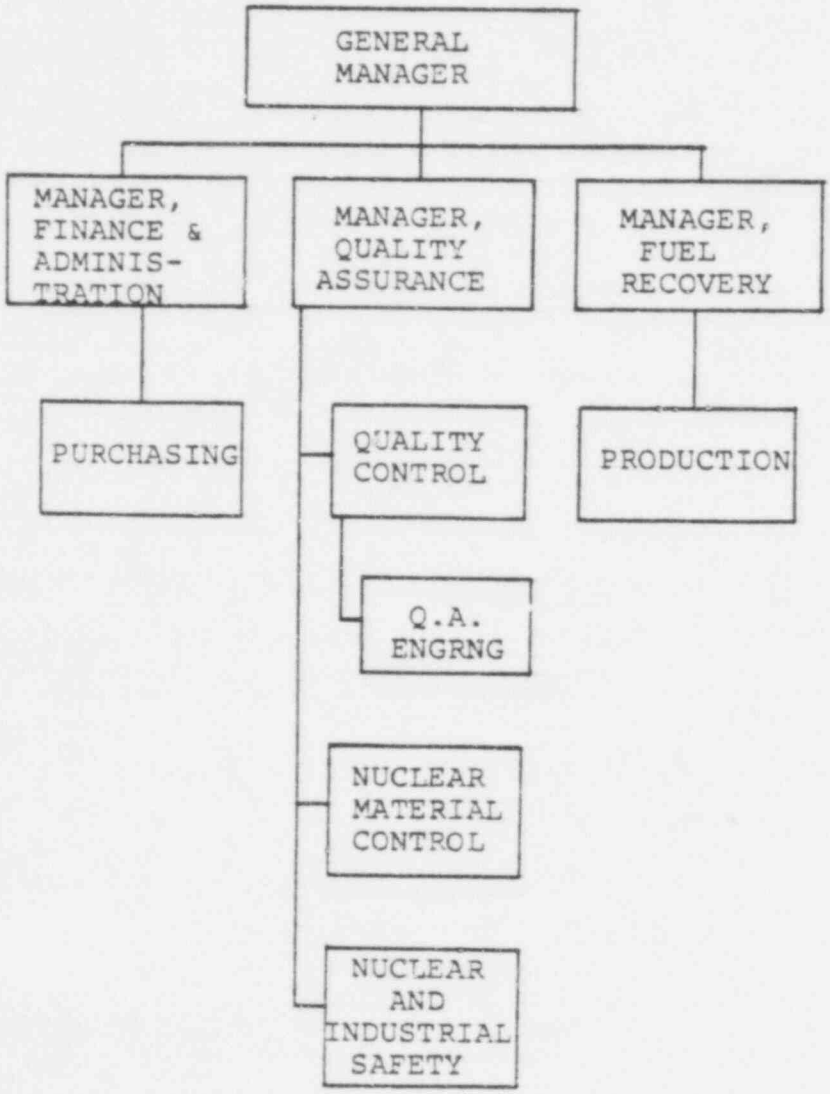
APPENDIX

FIGURE 1.1

FUNCTIONAL ORGANIZATION CHART

UNC RECOVERY SYSTEMS



APPENDIX

FIGURE 1.2

JOB FUNCTIONS

1. General Manager

   Responsible for overall management of UNC-RS.

2. Manager, Finance and Administration

   Responsible for purchasing and procurement of shipping containers and shipping services.

3. Manager, Quality Assurance

   Responsible for overall planning, administration, and control of Shipping Quality Assurance Program.

4. Quality Assurance Engineering

   Responsible, when applicable, for training, documentation and document control, control of purchased materials, parts and components, identification, control of special processes, inspection, test control, measuring and test equipment control, status control, control of non-conforming items, corrective action programs, quality assurance records, and audits.

5. Nuclear Material Control

   Responsible, when applicable, for shipping document preparation and control.

6. Nuclear and Industrial Safety

   Responsible, when applicable, for safety analyses, and inspection and preparation for shipment.

7. Manager, Fuel Recovery

   Responsible, when applicable, for handling and storage of shipping containers and components, repair of shipping containers, inspection and preparation for shipment.