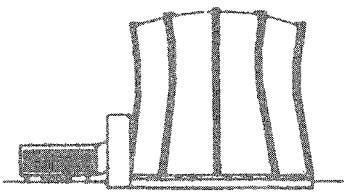
71-0934

TEXAS ENGINEERING EXPERIMENT STATION

TEXAS A&M UNIVERSITY

3575 TAMU
COLLEGE STATION, TEXAS 77843-3575



NUCLEAR SCIENCE CENTER
979/845-7551
FAX 979/862-2667

2006-0045

June 19, 2006

Document Control Desk
ATTN: E. William Brach
Director, Spent Fuel Project Office
MS 0-13D13
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Subject: **Texas A&M University Nuclear Science Center (Docket Number 50-128, License Number R-83) Submittal of Quality Assurance Program**

Currently the Texas A&M University, Texas Engineering Experiment Station's, Nuclear Science Center (NSC) is working with the U.S. Department of Energy (DOE), DOE contractors and the Nuclear Regulatory Commission (NRC) to convert the NSC TRIGA research reactor from Highly Enriched Uranium (HEU) fuel to Low Enriched Uranium (LEU) fuel in support of non-proliferation policies. Due to this planned reactor fuel conversion, the NSC will be shipping spent nuclear fuel and receiving fresh fuel to complete the conversion evolution. Federal regulation 10 CFR 71 Packaging and Transportation of Radioactive Material describes requirements for shippers of this and other radioactive materials. Subpart H of this regulation describes the requirements for a Quality Assurance (QA) Program, including the requirement to submit the proposed QA Program to the NRC for approval.

Attached is the NSC's proposed Quality Assurance Program. It has been reviewed by NSC management and our Reactor Safety Board which has recommended its submittal for review and final approval by the Nuclear Regulatory Commission.

If there are any questions or concerns with the QA Program please contact me at (979) 845-7551, and/or e-mail me at jaremlinger@tamu.edu .

Respectfully Submitted,

J. A. Remlinger
Associate Director, TAMU-NSCR

cc: Marvin M. Mendonca - NRC Project Manager
TAMU NSC Files

NRSSO1
A020

Texas A&M University
Texas Engineering Experiment Station
Nuclear Science Center
NRC Facility Docket Number 50-128
NRC Facility License Number R-83

Quality Assurance Program

June 19, 2006

Table of Contents

Texas A&M University Nuclear Science Center
Quality Assurance Program

Introduction

With this document the Texas A&M University Nuclear Science Center (NSC) establishes a Shipping Quality Assurance (QA) Program in accordance with 10 CFR 71, Subpart H. It is designed to assure the safety of the general public during packaging and transportation of spent fuel or receipt of fresh fuel.

Quality Assurance Program

1. Scope

The NSC Shipping QA Program establishes requirements applicable to the procurement, use, maintenance, and repair of packaging used to transport licensed material in excess of a Type A quantity (refer to 10 CFR 71.4 and Appendix A of 10 CFR 71). The program includes the purchase, handling, shipping, storing, cleaning, assembly, inspection, testing, operation, maintenance, and repair of Type B (reference 10 CFR 71.4 and Appendix A of 10 CFR 71) shipping containers regulated by 10 CFR 71. The QA Program applies to those activities affecting the casks and their components, which are significant to safety. Quality assurance comprises those planned and systematic actions necessary to provide adequate confidence that a system or component will perform satisfactorily in service. Shipping casks regulated by 10 CFR 71 will be released for shipping only after they have satisfactorily met the requirements of the NSC Shipping QA Program.

The description of the QA Program, contained within, will include a discussion of which requirements of 10 CFR 71, Subpart H are applicable and how they will be satisfied. The NSC does not store or maintain non Type A shipping materials and packages. Therefore, this QA Program shall require vendor supplied documentation of quality-related activities applicable to the design, fabrication, inspection, testing, purchase, use, maintenance and repair of packages used and provided by the vendor (or organization) for fuel transport to or from the NSC. Establishment of the QA Program deems that all quality related activities applicable to the design, fabrication, inspection, testing, purchase, use, maintenance and repair of packages are implemented with written procedures approved by appropriate levels of management and are contained in Shipping QA files.

The Director of the NSC retains the responsibility for the overall effectiveness of the QA Program.

Indoctrination and training will be included as part of an existing requalification program so that personnel performing quality-related activities are trained and qualified to perform these activities. Upgrading of personnel performing quality related work will be on a continuing basis as changes are implemented in quality assurance procedures.

2. Responsibilities

The Texas A&M University Reactor Safety Board (RSB) Committee is responsible for reviewing the facility's Shipping QA Program and its policies, goals, and objectives. The Director of the NSC retains overall authority and responsibility for the QA Program. All NSC personnel involved with the receipt or shipment of nuclear fuel shall follow this QA Program.

3. Quality Assurance Organization (10 CFR 71.103)

The facility organization chart can be found in the NSC Technical Specifications in Section 6.1. Any or all of the personnel on the NSC staff may perform functions under this QA Program as designated by the Director of the NSC. The Director will ensure that measures are established to provide adequate control over any designated quality-related activities. Individuals performing QA functions have the responsibility and authority to stop unsatisfactory work, the delivery or installation of nonconforming materials, and have direct access to the Director of the NSC, his designee, or higher-level management that can ensure accomplishment of quality-related activities.

The duties and qualifications required for the Director of the NSC, who retains overall authority and responsibility for the QA Program, and other principal personnel performing quality related functions will be established and documented in the QA files.

4. Package Design Control (10 CFR 71.107)

The NSC is only a user of packaging. Therefore, design activities will not be performed by this facility and the criterion of 10 CFR 71.107 is not applicable. However, the NSC shall assure that the design of the packaging used was accomplished under control of a NRC approved QA Program. This will be accomplished by requiring the supplier of packaging to submit documented proof (e.g. drawings, etc.) of package design under a NRC approved QA plan. Documented proof will be kept on file.

5. Procurement Document Control (10 CFR 71.109)

The NSC, when procuring packaging, shall require manufacturers of packaging to supply appropriate certifications verifying that the designated (model and serial number) packaging was manufactured under an approved NRC QA Program. Other pertinent documentation (as built drawings, photographs, sketches, use and maintenance manuals, etc.) are to be furnished by the manufacturer with the packaging. The Director of the NSC, or his designee, will determine all pertinent documentation required. If safety-related replacement parts are required to be procured for the packaging, the Director of the NSC, or his designee, will designate QA personnel to ensure that appropriate technical and QA requirements are included in purchase orders and that the purchase orders are placed with suppliers which have been previously qualified to supply the parts

required. Procurement shall be made in consultation with the package owner.

6. Instructions, Procedures and Drawings (10 CFR 71.111)

In the preparation of packaging for use, the Director of the NSC, or his designee, shall ascertain that the package with its contents satisfies the applicable requirements of 10 CFR 71 and of the licensee. The Director of the NSC, or his designee, must approve placing the package in use.

The Director of the NSC, or his designee, shall prescribe activities affecting quality by documented instructions or procedures of a type appropriate to the circumstances and shall require that these instructions or procedures be followed.

If repair or maintenance is required to be performed on packaging, a written procedure will be followed and coordinated with the package owner and quality assurance personnel to ensure that appropriate inspection and test points are incorporated in the procedure and that effective repairs have been satisfactorily performed. Any plans for maintenance will be reviewed by designated QA personnel (both NSC and vendor) to verify that the repair plans emphasize those characteristics that are most important to safety.

7. Document Control (10 CFR 71.113)

Each of the shipping and packaging documents under control of the Shipping QA Program will be identified and maintained in the QA files. Documents will be reviewed biennially by appropriate NSC personnel not directly associated with radioactive material shipping. Substantial changes to documents shall be reviewed and approved by the RSB Committee.

Control shall be exercised over the following documents, including the changes thereunto, used in the procurement, use, maintenance, and repair of Type B Shipping packages:

1. Operating procedures
2. Maintenance procedures
3. Inspection and test procedures
4. Loading and unloading procedures
5. Packaging and transport procedures
6. Repair procedures
7. Audits
8. Drawings
9. Training records

Controlled copies of approved procedures will be made available to persons responsible for using those documents.

8. Control of Purchased Material, Equipment and Services (10 CFR 71.115)

Designated QA personnel shall take the necessary measures to assure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement requirements. Documentary evidence that the package conforms to the procurement specifications shall be supplied with the package. This documentary evidence shall be retained and shall be sufficient to identify the specific requirements met by the purchased material or equipment.

9. Identification and Control of Materials, Parts and Components (10 CFR 71.117)

Designated QA personnel shall ensure that materials, parts, and components used for repair of Type B packaging are adequately identified and controlled to prevent use of incorrect or defective items. Where replacement of limited-life items is specified, measures will be taken to preclude the use of items whose shelf life or operation times have expired.

10. Control of Special Processes (10 CFR 71.119)

Special processes are not normally performed by the users of packaging. However, if packaging requires major repairs necessitating the use of these processes, designated QA personnel shall ensure that controls are followed for special processes subject to the following criteria:

1. Procedures, equipment, and personnel are qualified in accordance with applicable codes, standards and specifications
2. The operations are performed by qualified personnel and accomplished in accordance with written procedures with recorded evidence of verification
3. Qualification records of procedures, equipment, and personnel are established, filed, and kept current

No special process will be undertaken without consultation with the packaging owner and those processes will be performed in accordance with QA procedures established by the packaging owner.

11. Internal Inspection (10 CFR 71.121)

Visual inspections by designated QA personnel will be performed upon receipt of packaging to ensure compliance with procurement documentation and QA procedures. The criteria for acceptance of each of these inspections, and actions to be taken if non-compliance is encountered, will be determined in accordance with approved procedures. These visual inspections should include an inspection of the following:

1. Surface conditions
2. Weld and structural integrity

3. Condition of flange or sealing faces
4. Gaskets and seals
5. Gauges, rupture disks, valves, pressure relief devices
6. Condition of tie-down members
7. Labeling and marking
8. Leak tightness of the packaging

The inspection program should ensure adequate maintenance of packaging. The manufacturer/owner of the packaging should identify all items to be maintained, criteria for acceptability or replacement, and the frequencies of inspection assigned to each item during use of the package.

Prior to shipment, final inspections will be performed with a checklist to verify all the following items are complied with:

1. Packages are properly assembled
2. Valves are set to specifications
3. Shipping papers are properly completed
4. Packages are conspicuously and durably marked as required by DOT regulations
5. Individual designated by the owner or user of the package has given authorization for shipment of the package
6. Authorized individuals shall sign the shipping paperwork prior to release for shipment

12. Test Control (10 CFR 71.123)

A test program shall be established to ensure all the required testing of packaging components will perform satisfactorily in service. These written procedures will incorporate the acceptance limits contained in the package approval, provisions for assuring that all prerequisites for a given test have been met, that adequate test instrumentation is available and used and that the test is performed under suitable environmental conditions. Test results shall be documented by designated QA personnel and evaluated by a Director's designated member of management to assure that test requirements have been satisfied prior to delivering packages for transport to a carrier. The following items that apply shall be included in typical tests:

1. Structural integrity
2. Leak tightness
3. Component performance (e.g. valves, gaskets, fluid transport devices, etc.)
4. Shielding integrity
5. Thermal integrity

During the loading process periodic maintenance test programs shall be established to ensure that packages remain usable and free of excessive radiation and contamination.

13. Control of Measuring and Test Equipment (10 CFR 71.125)

Designated QA Personnel shall ensure that all instruments, gauges, and other measuring and testing devices used in activities affecting quality shall be properly controlled, calibrated (if necessary), and adjusted at specific times to maintain accuracy within necessary limits. This includes measuring and test equipment used for maintenance of safety related items. Inspection and test equipment will be tagged or labeled to indicate the date of the next planned calibration. All calibration test data shall be maintained with facility records or be readily traceable.

14. Handling, Storage and Shipping Control (10 CFR 71.127)

The handling, storage, and shipping of Type B packaging will be controlled to assure safety, minimize degradation, damage and/or loss.

Measures will be taken to control the handling, storage, shipping, cleaning, and preservation of materials and equipment to be used in packaging to prevent damage or deterioration. The following are actions that will be taken when handling or storing packages:

1. If packaging requires special handling and lifting equipment, then such equipment will be used to move packaging from one station to another
2. As required, special handling or storage provisions for packaging (e.g. shock absorbers, tags or markings to adequately protect and identify critical components, etc.) will be identified and used
3. As required, special protective environments (e.g. inert gas atmosphere, specific moisture content levels, and temperature levels, etc.) shall be specified and provided where required
4. All conditions identified in a certificate of compliance will be adhered to when unloading packaging

When preparing a package for shipment the following applicable measures will be taken:

1. Cavities within gas-cooled package containments have been adequately dried and cavities within liquid cooled packages have been drained to allow adequate void space
2. Specified operations, inspections, and tests have been completed prior to delivery to a carrier
3. NRC and DOT requirements have been satisfied prior to delivery to a carrier.
4. Necessary shipping papers have been prepared as required

15. Inspection, Test and Operating Status (10 CFR 71.129)

A tag, label, marking, log entry, or other documentation will indicate the status of Type B shipping containers. The records will indicate when periodic surveillance tests have been performed. No deviation from the required inspection, test or other critical operations is

authorized without the approval of the Director of the NSC or his designated members of management.

16. Nonconforming Materials, Parts or Components (10 CFR 71.131)

Designated QA personnel will ensure established measures are followed to control materials, parts, or components which do not conform to specified requirements in order to prevent their inadvertent use or installation. All materials, parts, or components for use by this facility which must be quality controlled will be inspected upon receipt by designated QA personnel. This inspection will include as a minimum:

1. Proper identification of item and any nonconformance
2. Segregation of nonconforming items
3. Disposition
4. Evaluation

All nonconforming items will be placed in designated control hold areas until proper disposition is completed. Nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures. The acceptability of nonconforming items after designated repair or rework will be verified by designated QA personnel by re-inspecting or retesting the item against the original requirements. All information that is discovered concerning a nonconforming item will be recorded and kept with QA records such that it can be analyzed by designated QA personnel to determine quality trends for appropriate management review and assessment.

17. Corrective Action (10 CFR 71.133)

For activities important to safety concerning use, maintenance and repair of Type B packages, the Director of the NSC, or his designee, shall ensure that conditions adverse to quality, (e.g. those resulting from failures, malfunctions, deficiencies, deviations and defective material and equipment, etc.) are promptly identified and reported to appropriate levels of management. In the case of a significant condition adverse to quality, a root cause of the condition will be determined and corrective actions taken to preclude recurrence.

18. Quality Assurance Records (10 CFR 71.135)

Sufficient written records shall be maintained in the QA files to furnish evidence of activities affecting quality. The records, shall include the following:

1. Instructions, procedures, and drawings required by 10 CFR 71.111
2. Design records
3. Inspections
4. Tests
5. Audits

6. Qualifications of personnel
7. Maintenance
8. Delivery of package to a carrier (including proof that applicable NRC and DOT requirements have been satisfied.

All shipments of radioactive material must be reviewed and approved by Health Physics personnel. Shipping records for radioactive material will be kept by the NSC Radiation Safety Office.

Records of fuel shipments, including superseded records, utilizing a leased cask shall be kept for at least three years from the date of the last shipment.

Records that are to be retained for the lifetime of the packaging should include:

1. Appropriate design and production-related records, which are generated throughout manufacturing and furnished with packaging
2. Records demonstrating evidence of operational capability
3. Records verifying repair, rework, and replacement that are used as a baseline for maintenance.

QA records shall be adequately stored to prevent loss or deterioration and marked so as to be readily identifiable and retrievable.

19. Audits (10 CFR 71.137)

Audits of each safety related activity shall be completed at least annually to verify compliance with all aspects of the QA Program for radioactive packaging covered under this program and to determine the effectiveness of the program. The audit shall be performed by members of the RSB or their designee, but not by staff having direct responsibility in the areas being audited. Audit results shall be documented and reviewed by NSC management and the RSB. Follow-up action, including the re-audit of deficient areas, shall be taken where indicated.