U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION IV

Report Nos. 71009001/80-01
99900382/80-01

Company: General Electric Company
Nuclear Fuel and Service Division
175 Curtner Avenue
San Jose, California 95125

Inspection at: Morris, Illinois

Inspection Conducted: February 25-29, 1979

Inspectors: W. M. McNeill 3/20/80
W. M. McNeill, Contractor Inspector — Date
Components Section I
Vendor Inspection Branch, RIV

W. M. McNeill for 3/20/80
J. T. Conway, Engineer — Date
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Transportation Certification Branch
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Components Section I
Vendor Inspection Branch, RIV

Summary

Inspection on February 25-29, 1980 (71009001/80-01 & 99900328/80-01)

Areas Inspected: A special inspection of the records of spent fuel shipping casks was performed in response to a request from the Transportation Certification Branch. The inspection involved eighty-four (84) inspector hours on site by three (3) NRC inspectors.

Results: Two (2) deviations and one unresolved item were identified.

Deviations: Records were not on file for: (1) relief valves certifications, (2) globe valves certifications (3) some material certifications, (4) some NDE personnel qualifications, (5) some nonconformance dispositions, and (6) some material changes as required by the SAR (See Notice of Deviation, Item A). Cask serial number 301 was not hydrostatically tested to 600 psig as required by the SAR (See Notice of Deviation, Item B).

Unresolved Items: Section 2.3.1 of the SAR identifies those items classified as critical to safety. However, the list does not address such critical items as attachments to pressure boundry parts, shielding (uranium, boroncarbide and neutron shielding system), and (3) support materials.

## DETAILS SECTION

Prepared by W. M. NcNeill, J. T. Conway and R. H. Odegaarden

### A. Persons Contacted

B. C. Benedictson, Project Manager
P. C. Dalrymple, Consultant
L. E. Fischer, Transportation System Manager
T. E. Ingels, Quality Assurance and Safeguards Manager
R. H. Jones, Consultant
J. D. Kesman, Plant Engineering and Maintenance Manager
L. G. Marquis, Quality Systems Assurance Manager
H. R. Strickler, Plant Operations Manager
T. E. Tehan, Engineer
*E. E. Voilland, Morris Operation Manager
W. C. Wheadon, QA Engineering Manager

*Did not attend exit interview.

### B. Records Review

#### 1. Background Information

Recent findings indicate that some spent fuel shipping casks are not in conformance with their Certificates of Compliance. An audit of the manufacturing records was requested. The memo concerning this item requests that the fabrication records be reviewed to establish whether objective evidence exists that will demonstrate that the casks were built, inspected, and tested, in accordance with approved drawings and with the Certificates of Compliance.

#### 2. Objectives

The objectives were to verify that the fabrication records, demonstrate that the spent fuel shipping casks were manufactured and tested in conformance with their Certificates of Compliance and approved drawings. Also that all repair and rework performed were verified as having been properly evaluated and approved, and any deviations from the certificate were properly reviewed and approved and such approval documented.

#### 3. Method of Accomplishment

The preceding objectives were accomplished by:

a. Review of the General Electric (GE) Certificate of Compliance, 9001, Revision 9; IF 300 Shipping Cask Consolidated Safety

Analysis Report, and the design drawings submitted to the NRC.

b. Review of the quality and manufacturing records of the four (4) IF 300 type casks. In particular material certifications were reviewed on a sample of twenty-eight (28) components for the casks. The Material Identification Records, Planning Route Sheets, Inspection Reports and the subvendor supplied certified material test reports, for the above parts were reviewed. In the above review the materials and their traceability were verified. Eight (8) dimensional checks were verified to have been performed, documented and accepted on each cask. About 20 nonconformances were reviewed to verify identification and disposition of nonconformances.

c. Review of the welding and nondestructive testing records for four (4) welds. In particular weld procedures WS-5-301 and WS-5-10, inspection procedures SR-ND-22 and SR-ND-15N were reviewed. The inspectors and welder's qualifications, Certificate of Qualification and Certificate of Compliance were inspected. The as-built drawings Planning Route Sheets, and Inspection Reports associated with the above reports were reviewed and the General Fabrication Specification, D-1, Revision 5.

d. Review of testing procedures, SR-PP-229 Revision 3, SR-PP-240, Revision 1, SR-PP-254, Revision 240 on thermal testing and the Planning Route Sheets, and test reports and records for casks serial numbered 301 and 302. The calibration information on the instruments used on casks 304 was also reviewed. Also the testing procedure, SR-PP-198 Revisions 2, 3, and 5 on hydrotesting and Planning Route Sheets, and test reports and records for all four (4) casks.

4. Findings

a. Deviations

See Notice of Deviation Items A and B.

b. Unresolved Item

The SAR and the fabrication specification D-1 identify a list of items critical to safety. This list focuses on

on containment under accident conditions as the definition of critical to safety. Section 3.1.2.(b) states that "structures, systems, components the quality of which will affect attainment of program safety objectives and criteria have been identified by thorough analysis of operating and potential accident conditions." The two sections of the SAR 2.3.1 and 3.1.2(b) of Appendix XI-1 are in conflict. The SAR identifies shielding and alike as operating safety objectives. The conflict is to be referred to US NRC Transportation Certification Branch for resolution by the Vendor Inspection Branch for measures to address to generic or precedent character of such a list.

c. Comments

In regard to Deviation A:

(1) The Targent Rock valves did have some documentation on file eg. material certification of valve bodies, test reports, etc. Condition number 17 of the certificate identifies the drawing and revision of the valves in question. There was not a statement on file that certified these valves to the special design and drawing identified.

(2) Condition 16 of the certificate identifies a SAR section on the 1" globe valves eg. 6.6.1.1 which inturn identifies such requirements as performance and a type valve to be used. These valves had some material certifications on file, however, it was not clear what parts the certifications where for eg., flange, pipe, bonnet, etc. Also it was not clear which serial numbered valve was represented by what paper work. It was also noted that two (2) orders had been made for valves sufficient for two (2) casks on each order. The orders were over a year apart but the material certifications on file were identical for both orders.

(3) Heat number 13524 had a certification on file which identified the material as "reject." The shielding material certification had the chemical data on file but not the yield, tensile, etc. and other physical data.

(4) The inspector in question stamped off the nondestructive testing operations, in particular liquid penetrant, for several welds on the fabrication casks serial numbers 301 and 302. The SAR in section 3.1.2(i) states in part: "Where special procedures are called for to assure requiste quality . . . requirements have been or will be established by appropriate documentation, including essential procedures and personnel qualifications." The qualifications in question would be to the requirements of SNT-TC-1A as is required by ASME Code NB-5500.

(5) Spun castings were used for the inner shell of casks serial numbers 301 and 302. The D-1 Specification detailed this material to be radiographed and accepted to an ASTM Standard E71-64. Ths supplier performe l the 100% radiography as was required by the purchase order SR54C10210 and found the material did not meet the standards. This was identified on the material certification dated November 22, 1972. Reported by an engineering evaluation had been performed to justify use of this material, however, records of this justification and disposition could not be found. The SAR in section 3.1.2.(m) states in part "Requirements are documented for . . . disposition of such items (sic nonconforming) and for necessary . . . record documentation."

(6) The first two casks had an inner shell made of a spun casting type 317 stainless steel. The last two casks serial numbers 303 and 304 were made with an inner shell that was rolled and welded type 216 stainless steel plate. The change from, or to, a spun casting by the fabricator and the approval could not be established. Note number six (6) on drawing number M-41, Inner and Outer Shell, references specification D-1, Section 5.4.1.3 states in part ". . . customer approval is required . . . for substitution of material and/or fabrication techniques . . . ." The SAR Section V, 5.3.4.4, also identifies the inner shell to be rolled and welded.

In regard to deviation B the Code of Federal Regulations part 71.53.(b) requires a preliminary pressure test to be 50 percent higher than the maximum normal operating pressure. The maximum operating pressure is 347, therefore the minimum test pressure would be 520 psig. ASME Code NB 6221 also specifies a minimum test pressure of 1.25 times the design pressure multiplied by the lowest ratio of the permissible stress-intensity valve to the design stress-intensity value. Cask serial numbers 302, 303 and 304 were tested at 600 psig, however, cask 301 was tested at 400 psig.

In regard to the thermal testing, sufficient information was found to conclude that the tests had been carried out as required by the Certificate. Only for cask 304 was specific calibration information available on the test instruments, however, no documentation showed that these instruments were the ones actually used. Cask 301 was the only one with any information given on calibration of thermocouples. Reports indicate that the heater thermocouples were calibrated at room temperature. The test reports also noted steam was vented during the test of casks 303 and 304. This would seem to introduce some error in the 100% thermal heat load data points. The packaging is approved for a maximum of 210,000 BTU/hr not the tested valve (about 260,000 BTU/hr).

d. General Information

General Electric had Stearns-Rogers of Denver, Colorado, do some of the design effort on the IF 300 casks. General Iron Works of Denver is Stearns-Rogers' fabrication Division. The design of the IF 300 was completed in early 1971. By 1972 fabrication began on the first two casks (301 and 302) which ended in late 1974. Before the end of fabrication, about six (6) months, of the first two casks a second campaign began for the last two casks (303 and 304). The fabrication on those casks lasted until early 1975. General Electric maintained overall responsibility for the casks. Two (2) General Electric resident engineers were assigned to General Iron Works and Stearn-Rogers during this time frame. This NRC inspection was of the fabrication records stored at General Electric's Morris, Illinois site.

C. Exit Interview

The inspector met with management representatives (listed in Paragraph A) at the conclusion of the inspection on February 29, 1980. The inspector summarized the scope and findings of the inspection. The management representatives had no comment in response to each item discussed by the inspector.