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

REGION V

Report No.	70-75/+/79-04	
D ket No.	70-754 License No. SNM-960	Safeguards Groupl
Licensee:	General Electric Company	
	Vallecitos Nuclear Center	
	Pleasanton, California 94566	
Facility Name:	Vallecitos Nuclear Center	
Inspection at:	Vallecitos Nuclear Center	
Inspection con	ducted: March 22, 1978	
Inspectors:	Heller 9 Ember N. J. Cooley, Fuey Facilities Inspector B.a. Rivellinger, Radiation Specialist 3. A. Riedlinger, Radiation Specialist	<u>4/30/79</u> Date Signed <u>4/3c/79</u> Date Signed
-	H. E. Book, Chief, Fuel Facility and Materials Safety Branch	Date Signed 4/30/79 Date Signed

Summary:

Inspection on March 22, 1979 (Report No. 70-754/79-04)

453 020

<u>Areas Inspected</u>: This inspection included a review of all available Engineering Change Notices which pertain to changes made to shipping casks. That review was from January 1972 through the date of this inspection. The purpose of the review was to determine the safety significance of those changes. The inspection also included a review of all Change Authorizations issued by the subject licensee for changes made on shipping casks. That review covered the period of 1970 to the present inspection. The purpose of that review was to determine the degree of the licensee's safety review of significant cask changes. The inspection also included a search of files at both the Vallecitos Nuclear Center and Region V offices to locate any documentation regarding leak tests performed in connection with the GE Model 1600 Shipping Container.

RV Form 219 (2)

Summary: (Con't.) (Inspection Report No. 70-7F4/79-04)

453 021

<u>Results</u>: The licensee was found in noncompliance with 10 CFH 71.12(b)(1)(ii) in that he had made changes in drawings for the GE Model 8500 Shipping Cask without suppling those changes to the Transportation Branch, Division of Fuel Cycle and Material Safety, U.S. Nuclear Regulatory Commission. Changes in drawings for the GE Models 100, 600, and 1600 had also been made without that type of review. Drawing numbers and revisions for the Model 8500 cask are listed in Item 5(a)(3) (Drawings) of Certificate of Compliance No. 6697.

The licensee was found to be in noncompliance with 10 CFR 71.12(b)(1)(ii) in that he had shipped radioactive material in the GE Model 1600 Shipping Cask on many occasions with the material encased in an inner container which had not been tested for leak tightness as required by Certificate of Compliance 9044, Item 5(b)(1)(i).

DETAILS

1. Persons Contacted

*G. E. Cunningham, Senior Licensing Engineer *T. C. Hall, Radiation Products and Services, Engineering *R. E. Butler, Manager, Radioactive Products and Services *J. I. Tenorio, Manager, Remote Handling Operations

*Denotes those attending the exit interview.

2. Introduction.

Inspection and Enforcement, Region V, was informed by IE Headquarters on March 19, 1979, of allegations concerning the use of shipping containers by the subject licensee. One allegation was that the licensee had made a number of drawing changes for the GE Model 8500 Shipping Cask (Certificate of Compliance 6697) without presenting those changes to NRC Head, arters. The second allegation was that the subject licensee had used the CE Model 1600 Shipping Cask (Certificate of Compliance 9044) for the transport of nonsolid radioactive material without testing inner containers of that material for leak tightness. Drawing numbers for the Model 8500 shipping cask, along with their revision numbers, are contained in Certificate of Compliance 6697. The requirement of leak tests on inner containers used with the Model 1600 cask is a requirement appearing in Certificate of Compliance 9044.

General Electric Model 3500 Shipping Cask (Certificate of Compliance 71-6697, Revision 3)

The referenced Certificate of Compliance specifies in Item 5(a)(3)(Drawings) a series of General Electric Company drawing numbers with their latest revision number as they pertain to the GE Model 8500 Shipping Cask. During November, 1978 through February, 1979, the subject licensee was in correspondence with both the Department of Transportation and the Nuclear Regulatory Commission regarding his request for the issuance of a Certificate of Competent Authority for the General Electric Model 8500 package consistent with the 1973 IAEA Regulations. During that correspondence it became apparent to Department of Transportation (DOT), Nuclear Regulatory Commission (NRC), and others that the pertinent drawings for the Model 8500 package had been revised on several occasions and that those revisions had not been supplied to the NRC incorporation in the Certificate of Compliance. Seven Model 8500 drawings were involved and the number of revisions of individual drawings which had not been supplied to the NRC ranged from one to five. The oldest revisions not supplied were dated approximately 1972.

By letter dated 'anuary 22, 1979, the subject licensee submitted to the Division of Fue, Cycle and Material Safety, US NRC, copies of those drawings including the most recent revisions. With that correspondence, the licensee submitted a summary of the drawing changes along with an evaluation as to the safety significance of each revision. The licensee's conclusion was that none of the revisions had safety significance or a degrading effect on the package design.

This inspection included a review of Engineering Change Notices (ECN) which the subject licensee had issued concerning changes on a number of radioactive material shipping packages dating from about 1972 to the most recent changes in 1978. The purpose of the review was to independently evaluate the safety significance of indicated changes. The review of ECNs verified that five changes in Model 8500 shipping package involved only drawing nomenclature and title changes. The review verified three drawing revisions were addressed to the use of aluminum pallets for the Model 8500 rather than wooden or plastic pallets. An Engineering Change Notice was reviewed which described small (1/4 inch) changes in the wooden overpack dimensions for the Model 8500 shipping cask.

The above described review of the Engineering Change Notices tended to confirm the substance and accuracy of the subject licensee's Attachment A to his letter to NRC dated January 22, 1979, regarding drawing revisions for the Model 8500.

Since approximately 1966, the licensee has employed a safety review mechanism for changes in facilities and equipment which is referred to as the Change Authorization Review. That Change Authorization Review is a current condition of the subject license and appears in Section 4.6, Change Procedures, Amendment No. 4, February 15, 1966. This inspection included a review of all Change Authorizations processed by the licensee since approximately 1970 which were addressed to changes in radioactive material shipping casks. The purpose of that review was to determine what type of shipping package changes were regarded to be of safety significance by the licensee. One Change Authorization was addressed to the Model 8500 and the subject was Model 8500 Series Cask Lid Inspection. That Change Authorization was addressed to the visual inspection of all 8500 casks and subseries 8400 and 8300 with particular attention drawn to cask serials numbers 8463 through 8480. Sketches were presented of acceptable and unacceptable welds at the cask lid and instructions were given for any required weld reworking, dye penetrant tests and records of the work done.

The Model 8500 and subseries 8400 and 8300 shipping casks are used for the shipment of medical isotopes, primarily molybdenum 99. They have not been used for the shipment of fissile material although permission to place fissile material in the cask exists in Item 5(b)(2) in the Certificate of Compliance No. 6697. The package identification number is USA/6697/B().

The licensee was found in noncompliance with the requirements of 10 CFR 71.21(b)(1)(ii) in that he did not adhere to the GE Model 8500 package drawings and revisions as listed in Item 5(a)(3) of Certificate of Compliance No. 6697. The item of noncompliance is categorized as an infraction because of the number of drawings which may be involved although it appears that the Model 8500 drawing changes had no safety significance and that the licensee had made an internal review regarding the safety of cask lid weld changes in compliance with the pertinent license condition.

The matter of drawing revisions for shipping packages was discussed in general terms with the licensee representatives. They pointed out that in their review of drawing changes for the Model 8500 cask they hid assembled Engineering Change Notices for about 13 additional models of shipping containers which are in use. They added that it was possible that the corresponding drawing changes had not been submitted to the NRC in a number of those cases. They added that a program had been instituted to document all changes affecting the design, fabrication, in service performance, and safety of transport packages in use. That documentation would be in the form of the latest drawing revisions along with a safety evaluation of each change which information would be submitted to the NRC as it was in the case of Model 8500 cask.

A drafted administrative procedure entitled Shielc Transport Container Documentation contained a documentation program to insure compliance with DOT/NRC regulations. That program included required reference documents such as the General Electric Company Quality Assurance Program for Packaging of Radioactive Material, the Title 10 CFR Part 71, the Title 49 CFR 173, and Safety Series No. 6, Regulations for the Safe Transport of Radioactive Materials, 1973 Edition. The documentation program is a part of the Quality Assurance Program for packaging of radioactive material submitted to the NRC by the licensee in accordance with 10 CFR 71.51 requirements. Priority efforts in that Quality Assurance Program will be directed to furnishing the NRC with the latest drawings on shipping containers (as in the case of the Model 8500, above) and obtaining IAEA Certification of Competent Authority with respect to the 1973 Edition of the IAEA Safety Series No. 6, Regulations for the Safe Transport of Radioactive Materials. Those efforts were being pursued by the licensee and had been completed for the GE Models 8500 and 100 Shipping Containers.

The licensee chose the Model 100 cask for his second review because the Model 100 is the prototype of several larger casks used by the licensee including the Model 600 and Model 1600. The Model 100 has been fully tested for the hypothetical accident conditions and those results used as a point of departure for extrapolation to the required structural strengths of the crash shields for the larger casks.

4. <u>General Electric Model 1600 Radioactive Material Shipping Cask (Certificate</u> of Compliance No. 9044)

As outlined in the report Introduction, information furnished to Inspection and Enforcement, Region V, concerned the failure of the licensee to make leak tests of inner containers of radioactive material, which inner containers had been placed in the GE Model 1600 cask for transport. The requirement for testing those internal containers appears in Item 5(b)(1)(i) of Certificate of Compliance No. 9044, dated April 13, 1977. The wording of that requirement (in part) is, "...All material shall be clad, encapsulated or contained in a metal encasement and tested for leak tightness prior to loading in the package in accordance with the statements and representations contained in the licensee's submittal, dated February 12, 1969." The corresponding wording in the licensee's submittal dated February 12, 1969, was "...Clad, encapsulated or contained in a metal encasement of such material as to withstand the combined effects of the internal heat load and the 1475^oF fire with the closure pre-tested for leak tightness."

In a subsequent submittal for amendment a November 15, 1973 letter refers to the original application and to a letter from the licensee to NRC dated November 9, 1972. (The November 9, 1972 date on that letter is an apparent error and should be October 9, 1972.) In the November 15, 1973 letter, along with its references including the erroneously dated October 10, 1972 letter, the licensee attempted to demonstrate the leak tightness of the Model 1600 cask (and the Model 600 cask). A paragraph of the November 15, 1973 letter is quoted as follows, "It is not inte ted that the primary containment of the material rest with the waste liner or fuel cladding, but rather that the cask itself be considered the primary However, the November 15, 1973 letter was addressed to a barrier.' specialized use of the Model 1600 container and not specifically to the type, form, and quantities of material per package as expressed in Item 5(b)(1)(i) in the Certificate of Compliance No. 9044. It appears that, for that reason, the corresponding amendment to SNM-960 (Amendment No. 71-57) dated November 19. 1973, was not changed to include radioactive material which was not in special form or in metal encasements tested for leak tightness prior to loading in the Model 1600 package. The requirement for primary leak tight containment of byproduct material and special nuclear material as solid metal or oxides was then perpetuated through the issuance of the original Certificate of Compliance No. 9044 and its revisions through revision number 2.

The above chronology was developed as a result of discussions with the licensee and a file search conducted at the licensee's facility and in the Inspection and Enforcement, Region V office. The discussions with the licensee indicated that he has used the GE Model 1600 shipping cask for the transfer of spent fuel rods which were known to be not leaking without further primary containment and for spent fuel rods known to be leaking, sealed in 1 inch diameter pipes and thereby meeting the requirements of Certificate of Compliance 9044, Item 5(b)(1)(iii); for the

shipment of dispersible radioactive material encapsulated in five inch diameter pipes which are 2R type containers but which wer not leak tested either generically or prior to each shipment; and dispersible radioactive material contained in waste buckets which are mechanically closed primary containers which were not leak tested and which could not be regarded as leak tight. The licensee has additionally shipped neutron sources in special form in compliance with Item 5(b)(1)(ii) of Certificate of Compliance No. 9044.

Because of the numerous waste snipments in waste liners and waste buckets, neither of which and been leak tested generically or routinely, the licensee was found in noncompliance with Item 5(b)(l)(i) of the Certificate of Compliance No. 9044, Revision No. 2.

The licensee's representatives replied that they believed they had demonstrated the cask Model 1600 to be a primary barrier by the November 15, 1973 letter and its referenced documents including the statement of form of cask contents in Section 5.12.2(b), page 7, Appendix D, SNM-960 which was transmitted with the licensee's application for license amendment, dated February 12, 1969. The licensee representatives gave no indication that they had challenged or taken exception to the wording of Item 5(b)(1)(i) of the Certificate of Compliance No. 9044 which requires leak tight inner primary containment of material placed in the Model 1600 cask.

This inspection included a review of Engineering Change Notices associated with several shipping casks used by the licensee. That review indicated that changes have been made in drawings of the Model 160C shipping cask to revise welding to make the interior of the cask water tight (12/01/72); Model 1600 drain plug had been changed from stainless steel to brass, lid bolts changed from stainless steel to cadmium plated steel (3/27/73); Model 1600 cask modification of lifting ears and changes in cask tie-down shackles (3/03/77).

This inspection also included a review of Change Authorizations with respect to changes in the Model 1600 cask. A Change Authorization dated April 6, 1978, reviewed the safety of adding redundant lifting ears to the Model 1600 cask; sloping the lower section of the cask base to eliminate its being handled by fork lift truck; placing plugs in bolt holes to reduce the possibility of contamination in the bolt holes. A Change Authorization dated April 17, 1978, provided for the straightening of the cask lids for Model 1600 cask, serial number 1604. The lid had been damaged, onsite, on March 24, 1978, causing deformations of 1/4" and 3/4" in the cask lid. A lifting eye had been bent and found to be unusable requiring replacement. A lifting ear had been nicked. The change authorization gave repair instructions.

5. Management Interview

The scope and the results of the inspection were discussed with licensee representatives Messrs. Cunningham, Butler, Hall, and Tenorio at the conclusion of the inspection on March 22, 1979. Those persons were informed of the items of noncompliance which are detailed above in this report.

Discussion with licensee representatives continued with regard to possible corrective action to be taken. Those licensee representatives made the following oral commitments to the NRC inspectors:

- The licenses will provide the NRC Transportation Branch with a. updated drawings through the latest revision for all shipping casks and shipping containers for which Certificates of Compliance have been issued and use permits granted to General Electric Company. Each updated drawing set will be accompanied by an evaluation of the safety significance of those drawing changes for each shipping package as was done in the case of GE Model 8500 cask. The order in which those reviews will be made are first for the Model 8500 cask (has been accomplished); second for the Model 100 rototype cask (nearly completed); and finally prompt corrective action in the two cases referred to I&E Region V by NRC Headquarters (Model 8500 and 1600). The licensee will then, on a priority basis, submit drawing revisions and evaluations for all other shipping casks along with safety evaluations of those revisions in those cases in which revisions have been made to drawings listed in the corresponding Certificates of Compliance.
- b. Concurrent with the above effort, the licensee will submit to NRC Headquarters for review all available information regarding the purported primary leak tight integrity of the Model 1600 cask in an effort to qualify that cask as a primary containment.
- c. The licensee will immediately suspend all Model 1600 shipments of radioactive material using the internal "waste bucket" container which has not been and cannot be qualified as leak tight. That suspension will continue until and if the Model 1600 container can be qualified as a primary container by NRC Headquarters review. (A Model 1600/Waste Bucket shipment was awaiting transfer to a carrier at the Vallecitos Nuclear Center at the time of this inspection. The licensee stated that he would postpone that shipment.)
- d. Concurrent with the above efforts, the licensee will qualify his "waste liners" as 2R containers by performing generic leak tests. It was observed during this inspection that the waste liners, except for the qualifying leak test, were essentially 2R containers. Subsequent to that qualification, the licensee may use the Model 1600 container for

shipment of byproduct material and special nuclear material as solid metals or oxides only in those qualified 2R containers which have been generically leak tested as required by the current Certificate of Compliance 9044.

- e. The licensee may transfer the radioactive materials from the Model 1600/waste bucket system presently awaiting shipment to qualified 2R containers and use those containers with the Model 1600 shipping cask to accomplish the waste shipment being held up.
- f. If and when the licensee can qualify the Model 1600 container as a primary leak tight vessel under the hypothetical accident conditions to the satisfaction of NRC Headquarters and thereby have the wording of Item 5(b)(1)(i) of Certificate of Compliance 9044 amended to that affect, the shipment of byproduct and special nuclear material as solid metal or oxides may be resumed using the "waste bucket" or similar systems.

The licensee was informed that a broader review of his transportation program would be made during the next regularly scheduled inspection of License SNM-960.



UNITED STATES NUCLEAR REGULATORY COMMISSION REGION V 1990 N. CALIFORNIA BOULEVARD SUITE 202, WALNUT CREEK PLAZA WALNUT CREEK, CALIFORNIA 94596

JUN 11 1939

Docket No. 70-754

General Electric Company Vallecitos Nuclear Center P. O. Box 460 Pleasanton, California 94566

Attention: Mr. R. W. Darmitzel, Manager Radiation Processing Operation

Gentlemen:

Thank you for your letter dated May 16, 1979, informing us of the steps you have taken to correct the items which we brought to your attention in our letter dated May 1, 1979. Your corrective actions will be verified during a future inspection.

Your cooperation with us is appreciated.

Sincerely,

A E. Book

H. E. Book, Chief Fuel Facility and Materials Safety Branch

GENERAL CELECTRIC

NUCLEAR ENERGY

ENGINEERING

GENERAL ELECTRIC COMPANY, P.O. BOX 460, PLEASANTON, CALIFORNIA 94566

DIVISION

May 16, 1979

Mr. R. H. Engelken, Director Office of Inspection and Enforcement Region V U.S. Nuclear Regulatory Commission Suite 202 Walnut Creek Plaza 1990 N. California Boulevard Walnut Creek, California 94596

Reference: 1) License SNM-960, Docket 70-754 2) Inspection Report, 70-754/79-04 with Letter, May 1, 1979

Dear Mr. Engelken:

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This letter is in response to your letter of May 1, 1979, concerning the inspection conducted by your staff on March 22, 1979. This special inspection was requested by the Vallecitos Nuclear Center (VNC) to clarify some possible differences in interpretations between VNC and the NRC concerning shipping practices.

As the result of this inspection, two items requiring correction were noted. The first of these concerned changes in engineering drawings for NRC certified shipping containers. These engineering drawings were first submitted over ten years ago to permit the then AEC to make safety evaluations on the containers. As the drawings are listed as part of the Certificates of Compliance, the NRC has determined that all revisions to these drawings, whether safety related or not, should be submitted to the Commission. VNC had not submitted all changes due to their trivial nature, e.g., changes in paint specifications, changes in drawing titles, changes in nameplates, etc.

VNC had, however, utilized internal review procedures including the Change Authorization to evaluate any changes with potential safety significance. The use of such internal review procedures is consistent with the provisions of License SNM-960 as prior to the implementation of the Certificate of Compliance system the containers were licensed as amendments to that license.

VNC has begun a program of updating the Certificate of Compliance by submitting copies of the latest revisions of the appropriate engineering drawings for each container (the drawings for two containers have already been submitted) along with an explanation for each change. VNC expects to complete this program for models currently in use in the fourth calendar quarter of 1979. Additionally, a new administrative procedure has been established to assure that all drawing changes will be submitted to the Commission following internal review and approval.

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Mr. R. H. Engelken

The second item concerned the use of the Model 1600 container as the leaktight containment for shipments in mechanically closed primary containers. This problem arose from a small, but significant, variation in the wording of the Certificate of Compliance versus the wording for the Certificates for our other shielded shipping containers. As noted in the Inspection Report, VNC believed that we had demonstrated that the Model 1600 qualifies as a primary containment and that the additional leak-tight inner container was not necessary. Some additional confusion arose from the fact that the Department of Transportation Special Permit for the container reflected the VNC interpretation. Generic testing of the cask seal had been documented in one of the Model 1600 submittals.

VNC has suspended all waste shipments in the mechanically closed waste buckets. The waste shipments will be made only in waste liners or other inner containers which have been qualified by performing generic leak tests. Work is in progress on qualifying these containers. VNC will also pursue the possibility of demonstrating that the Model 1600 container is adequate as a primary containment. As the use of tested containers for shipments assures compliance with Certificate of Compliance No. 9044, a schedule for qualification of the Model 1600 as a primary containment has not yet been established.

Therefore shipments made pursuant to Certificate of Compliance No. 9044 Section 5 (b)(1)(i) shall be made as follows: (1) fuel rods with intact cladding and special form or encapsulated solid or oxide materials will need no additional containment; and (2) materials not meeting these requirements will be placed in inner containers which have been generically or individually leak-tested.

We would note that shipments using the mechanically closed containers have been made for many years without incident.

Sincerely, Ell'Darmity

R. W. Darmitzel, Manager Irradiation Processing Operation

VCC