LICENSE FILE

OCT 05 1992

Combustion Engineering, Inc.
ATTN: James A. Rode
Plant Manager
Hematite Nuclear Fuel Manufacturing
ABB CE Nuclear Fuel
P. O. Box 107, Highway P
Hematite, MO 63047

License No. SNM-33
Docket No. 70-0036

Dear Mr. Rode:

This refers to the announced special safety inspection conducted by Messrs. J. Gavula and G. France, III, of this office on September 14-16, 1992, of activities that affect your license amendment request for consolidating uranium manufacturing operations at your Hematite facility, under NRC Special Nuclear Material License No. SNM-33. This also references the discussion of our findings with Mr. L. Grossman, project manager of the consolidation operation, at the conclusion of the inspection, and the follow up discussion with Ms. B. Bieser, the project scheduler, by telephone on September 21, 1992.

The enclosed copy of our inspection report identifies areas examined during the inspection. As described in the report the emphasis of this inspection was the review of the installation of the uranium oxide storage and retrieval system.

Our evaluation of the uranium oxide storage unit has determined that the construction and installation to date has been accomplished with sound engineering practices. However, as discussed with Mr. Grossman during the inspection a concern was raised that the seismic load was not considered for the interaction between the walls and a free standing unit. As a safeguard and as agreed upon during the inspection, it is our understanding that additional bolts and channel nuts will be attached to the bottom of the frame and that the unit will be anchored to the concrete base, thus providing additional stability. It is also our understanding that a seismic evaluation will be obtained prior to placing the unit in operation. This evaluation along with a review of the additional anchoring of the unit will be reviewed during a future inspection.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC Public Document Room.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

Original Signed by Roy J. Caniano

Roy J. Caniano, Acting Chief
Nuclear Materials Safety Branch

L-74

Enclosure: Inspection Report
No. 70-0036/92004

cc w/enclosure:
Jeremiah W. (Jay) Nixon,
Missouri State Senator
Dr. Richard S. Siudek, President,
ABB CE Nuclear Fuel
Mr. S. B. Junkrans, Vice President,
Manufacturing Operations
Mr. A. E. Scherer, Vice President,
Regulatory Affairs
Mr. L. Grossman, Director, Manufacturing
Technology, Nuclear Fuel
Mr. C. B. Brinkman, Manager,
Washington Nuclear Operations
Mr. J. F. Conant, Manager,
Nuclear Materials Licensing
Mr. H. E. Eskridge, Manager, Nuclear Licensing,
Safety and Accountability
M. Tokar, NMSS/IMSB
DCD/DCB (RIDS)

RIII
AMF w/ YES
France/bt
10/05/92

RIII
YES
Gavula
10/5/92

RIII
Caniano
10/5/92

HQ NMSS
Tokar

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 70-36/92004

License No. SNM-33
Docket No. 70-36

Licensee: Combustion Engineering, Inc.
Nuclear Power Systems
Windsor, CT 06095

Facility Name: Hematite Facility

Inspection At: Hematite, Missouri

Inspection Conducted: September 14-16, 1992

Inspectors: George M. France, III
George M. France, III Fuel Facilities Inspector
Date: 10/05/92

James A. Gavula, Reactor Inspector
Date: 10/5/92

Approved By: Roy J. Caniano, Acting Chief, Nuclear Materials Safety Branch
Date: 10/5/92

Inspection Summary

Inspection on September 14-16, 1992 (Report No. 70-0036/92004 (DRSS)) Areas Inspected: This was an announced inspection to observe the installation of a uranium oxide storage and retrieval system (Kardex Unit). The inspectors also reviewed appropriate drawings and held discussions that were relevant to the design and installation of the Kardex unit.
Results: The inspector determined that the construction and installation of the unit was accomplished with sound engineering practices. The inspector also determined that strengthening the unit by adding bolts to the bottom frame, followed by anchoring the unit to the concrete base should provide a storage unit that is structurally adequate to perform its design function. However, a concern was identified that the seismic load was not considered for the interaction between the walls and a free standing unit. Kardex Systems design engineer agreed with the inspectors findings that it may be appropriate to anchor the unit to the concrete base to provide additional safety. The licensee's project manager concurred with this finding and will pursue anchoring the unit to the floor, followed by an appropriate seismic evaluation.

DETAILS

1. Persons Contacted

B. Bieser, Project Scheduler
E. Criddle, Health Physics Supervisor
*L. Grossman, Director, Manufacturing Technology, Nuclear Fuel; and Manager, Fuel Rod Loading Project
J. Rode, Plant Manager
D. Rohde, Project Manager

*Denotes licensee attendance at the exit meeting on September 16, 1992.

The inspector also interviewed representatives of the licensee's vendor, Kardex Office Systems.

2. Licensee Program

The Combustion Engineering facility at Hematite, Missouri, produces uranium dioxide (UO_2) fuel for the commercial nuclear power industry. Low enriched uranium hexafluoride (UF_6) limited to a maximum enrichment of 5% uranium-235 is received from Department of Energy (DOE) uranium enrichment/gaseous diffusion facilities in 2.5 ton, 30 inch diameter cylinders. The licensee processes UF_6 through a series of reactors (R-1, R-2, and R-3) where UF_6 is converted to an oxide powder. The powder is pelletized, shipped to a fuel fabricator and ultimately used for commercial fuel.

3. Background

On August 5, 1992, Combustion Engineering submitted an application to NMSS for a license amendment to Special Nuclear Material License No. SNM-33. Approval of this amendment application will enable the licensee to consolidate uranium manufacturing operations at their facility located in Hematite, MO. The operations will include an upgraded version of the basic rod loading and assembly manufacturing steps that were previously performed at their Windsor, CT operations under a different license. This consolidation will require the use of automated equipment to store, retrieve, and load UO_2 pellets into fuel rods. During this inspection, the inspectors examined engineering drawings and specifications, held discussions with the vendor representatives, and observed the partial assembly of a uranium oxide pellet storage and retrieval rack. The storage rack, a fully automated unit, manufactured by Kardex Office Systems, is capable of automating the storage and retrieval of more than 55 trays containing more than 5 tons of UO_2 pellets.

4. Uranium oxide (UO_2) Storage and Retrieval System (KARDEX STORAGE UNIT)

The storage units appear to be of a general industrial design and are not built to any specific design code. In this application, six individual units are attached to each other to form a single structure. The licensee purchased a "seismic upgrade" package that added additional cross bracing to the standard units. According to the manufacturer, similar units have been installed in California and have been evaluated for seismic loading. Although the licensee had not purchased this evaluation, discussions with the project manager indicated that they would pursue obtaining the evaluation to assure the seismic adequacy of the structure.

Each unit is a bolted structure constructed from "unistrut" type open section members and formed thin gauge material. Outer vertical members approximately 20 feet long are attached to formed pan support brackets that are in turn attached to the internal vertical members. Outer members have lateral braces and cross bracing added. Due to the tray access requirements, internal members can not be cross braced, but do have "horizontal spreaders" at several vertical locations which will provide some lateral stability.

Shop welding was performed on two of the component details. Small diameter bolts were capacitor-discharge stud welded to the bottom of the pan supports for the horizontal spreader attachments. These welds appeared to be adequately performed. For the other component, angle brackets were welded to the bottom frame members. The design drawing specified 0.188 inch by 1.0 inch long fillet welds at six locations. Because of the component sizes, the fillet welds specified could not physically be made. The "as-constructed" weld was a groove weld with maybe a 0.10 inch throat due to the radius of the formed channel. In many cases the lengths of the welds measured in the field were approximately 0.75 inch instead of the 1.0 inch specified. During discussions, the Kardex design engineer stated that these welds were only performed to facilitate construction, and that the loads on these welds would be minimal since the connection would be in compression. For seismic installations, he stated that it may be appropriate to install the bolts and channel nuts to provide additional safety margin in these connections. This issue was communicated to the licensee's project manager who concurred with this approach and said they would have the additional bolts installed.

No anchorage details were specified for the unit. When questioned, the Kardex designer said it could either be anchored to the concrete slab or left to "float"; however, it depended on what the purchaser wanted. The unit will be enclosed by a partially reinforced masonry block wall which was evaluated for seismic loads. The evaluation of the walls did not consider any seismic interaction between the walls and a sliding unit. After discussions, the licensee stated that the units would be anchored to the floor.

The building housing the Kardex unit was designed to BOCA (Building Official and Code Administration) National Building Code with a seismic zone 2 and a 1.5 Importance Factor. The foundation for the Kardex unit, which is independent of the building foundation, was also designed with these same parameters. The calculation for the Kardex foundation was reviewed by the NRC inspector and found to use conservative assumptions and appropriate methodology for the design.

Based on the observed construction details, in conjunction with the above mentioned refinements for equipment anchorage and bottom frame bolting, the NRC inspector considered the Kardex storage unit to be structurally adequate to perform its design function.

The vendor completed the assembly of three of the six units during the inspection. On September 21, 1992, via telecommunications the licensee's project scheduler indicated that the vendor had completed the assembly (w/metal skin) of all six units.

5. Exit Meeting

The inspectors met with those indicated in Section 1., of this report, at the conclusion of the onsite inspection to summarize the scope and findings of the inspection.

The licensee indicated that they would pursue attaching additional bolts and channel nuts to the base frame to strengthen the unit, anchor the unit to the concrete base, and evaluate the unit in accordance with the appropriate seismic zone.

Although the Kardex unit is not classified as proprietary, the vendors drawings are considered sensitive to manufacturing technology and therefore copies of such were not provided to the inspectors.