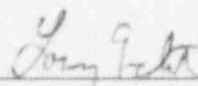
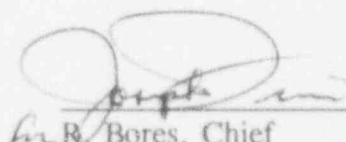


U.S. NUCLEAR REGULATORY COMMISSION
REGION 1

Report No. 70-1100/94-01
Docket No. 70-1100
License No. SNM-1067 Priority 1 Category ULFF
Licensee: Combustion Engineering, Incorporated
1000 Prospect Hill Road
Windsor, Connecticut 06095-0500
Facility Name: Nuclear Fuel Manufacturing and Nuclear Laboratories
Inspection At: Windsor, Connecticut

Inspection Conducted: May 16-18, 1994

Inspector:  4/15/94
J. Noggle, Sr. Radiation Specialist Date

Approved by:  4/15/94
R. Bores, Chief Date
Facilities Radiation Protection Section

Areas Inspected: An announced safety inspection was conducted by a region-based inspector to review audits and surveillances, organization changes, operations, radiation protection, effluent releases, and transportation of radioactive material.

Results: The inspection occurred after the mobilization of British Nuclear Fuels, Limited (BNFL) personnel on site to begin decontamination and decommissioning of the fuel fabrication facility and associated warehouse. No decontamination/decommissioning activities were in progress at the time of this inspection.

A review of specified safety program elements specified in license requirements were made and determined to be intact for 1993, with one exception. One violation of NRC regulatory requirements was identified, in that at the time of this inspection, the liquid effluent

discharge tank level indicators had not been calibrated for several years. The inspector noted that this item was identified during the 1993 environmental program audit and corrective actions had not effected a timely resolution of this license requirement.

In April 1994, a new organizational structure was implemented by ABB Combustion Engineering. Several radiation protection program elements had been transferred to the new radiation protection organization but have not yet been fully assimilated or reactivated. These areas include the tracking of personnel exposures, gaseous and airborne effluent releases, and an As Low As is Reasonably Achievable (ALARA) program for 1994. The licensee indicated that decontamination operations will not begin until these program elements have been reactivated for the protection and safety of the worker. Due to the lack of available records during this inspection, two unresolved items were identified. Liquid effluent release data were not available as of May 26, 1994 to determine license compliance. A second item involved the unmonitored disposal of sanitary sewage waste to the Metropolitan District Commission (MDC) that was observed during this inspection. The licensee indicated that the sanitary sewage piping system had always been isolated from site contaminated waste systems, but was unable to provide records during the inspection to demonstrate that sampling was not required.

DETAILS

1.0 Individuals Contacted

1.1 ABB Combustion Engineering, Inc.

- * D. Cirelli, Vice President of Finance
- * J. Conant, Facilities Manager
- * J. Limbert, Manager, Radiation Protection and Industrial Safety
- * M. Michelsen, Licensing Engineer
- * R. Sheeran, Project Manager
- * S. Sorensen, Radiation Protection Manager, Nuclear Services

1.2 British Nuclear Fuels Limited

- * A. Bradbury, Manager, Radiation Protection and Industrial Safety
- * D. Leigh, Project Manager

1.3 USNRC Personnel

- * R. Bores, Chief, Facilities Radiation Protection Section, Region I
- * D. Everhart, Health Physicist, Region I
- * S. Soong, NMSS Project Manager, Headquarters

1.4 State of Connecticut

- * K. Scott, Department of Radiation Control

* Denotes those present at the exit interview. Other individuals were also interviewed during this inspection.

2.0 Audits and Surveillances

The inspector reviewed the quality oversight program with respect to the following SNM License No. 1067 Safety Evaluation Report (SER) commitments listed below.

- The SER commits to a semi-annual radiation protection audit and an annual environmental audit.
- The Facility Review Group (FRG) is committed to provide safety oversight of the Nuclear Fuel Manufacturing Facility and Product Development Laboratory, and provide quarterly reports issued to the Facility Manager.

- The Safety Committee is committed to provide quality oversight external to the responsible organization and to provide an annual audit to the President, Nuclear Fuel.

The inspector verified the performance of semi-annual radiation protection audits during 1993 and reviewed the results. The audits were performed by a CE technical employee unassociated with the program being audited. The audits were in a checklist format without any significant findings reported.

The inspector verified the performance of the environmental audit conducted for 1993 and reviewed the results. On September 24, 1993, the auditor reviewed the status of the 1992 environmental audit finding that indicated follow-up action was required to ensure that liquid level instruments in each dilution tank was calibrated on an annual basis. The 1992 audit finding indicated that it had not been possible for several years to perform a calibration check on dilution tank level instruments. The 1993 audit indicated no change in this status and the tank level instruments had not been calibrated. The licensee's Facility Review Group reviewed the 1993 environmental audit finding and determined that this item could be closed without calibrating the instruments since this requirement was being deleted via a submittal to the NRC for a diminished SNM-1067 laboratory license. This application for a significantly reduced license application has not been approved by the NRC and pertains to a laboratory-only operation. The decontamination and decommissioning operation of the nuclear fuel manufacturing facility will occur during the next two years while laboratory operations continue. The inspector determined that the licensee has not been responsive to the audit finding in correcting the self-identified violation of License Condition S-6 of License No. SNM-1067, which states that "The instruments measuring the liquid-waste level in each dilution tank prior to discharge to the Farmington River shall be calibrated at least annually." Contrary to this requirement, as of May 18, 1994, the licensee had not calibrated the dilution tank liquid level instrumentation for several years. The licensee has implemented an alternate method of assuring adequate dilution to meet the release criteria by completely filling the dilution tanks and discharging the resulting liquid effluent via the site brook to the Farmington River. This method has not been approved by the NRC and the licensee has not received a license amendment to that effect. This is a violation of License Condition S-6. (70-1100/94-01-01)

The licensee utilized a safety incident resolution program called an Abnormal Event Occurrence (AEO) Report program. Procedure AP-2, Revision 2, provided a mechanism for abnormal events to be immediately investigated and corrected. The AEO Review Committee was made up of the various fuel production managerial positions that no longer exist. The Facility Manager indicated that the AEO program was needed and would be continued, however at the time of this inspection, the program was not integrated into the existing management organization and was not specifically assigned to any one person or organizational unit. The Facility Manager

indicated that the necessary procedure revisions and reestablishment of the AEO Review Committee would be completed prior to initiation of decontamination and decommissioning activities.

The FRG quarterly reports for 1993 were completed and covered the final fuel manufacturing operations and some limited decontamination activities in the facility. The 1993 quarterly reports served to schedule the required safety audits and to resolve any safety issues. The Nuclear Safety Committee conducted an audit of the nuclear fuel manufacturing and product development facilities on August 23, 1993. Three outside consultants toured the facility after a pre-tour briefing. Attention to outdated postings of SNM limits was observed. Also, the 1992 Safety Committee audit had recommended that lessons learned from the AEO reports should be incorporated into the employee training program. The current audit indicated that this item had yet to be implemented. No other significant findings were reported. The inspector verified that the above mentioned license requirements for management oversight of plant safety were fulfilled for 1993.

3.0 Management Changes

On April 5, 1994, the licensee terminated all employees of the nuclear fuel manufacturing facility and the SNM-1067 license was put under a licensee-requested 30-day suspension during the onsite mobilization of a new contractor organization tasked with performing the decontamination and decommissioning of Buildings 17 and 21, which were associated with fuel manufacturing activities. The inspector reviewed the new organizational structure, resumès, and held discussions with the new personnel. The licensee has several ABB Combustion Engineering, Inc. personnel occupying contractor oversight positions including: the Facility Manager, the Project Manager, the Licensing Engineer, and the Radiation Safety Officer. The individuals occupying these positions were found to have appropriate experience, education and training to provide for workers' safety, comply with the license requirements, and to oversee the decontamination and decommissioning activities. The contractor, British Nuclear Fuels, Limited (BNFL), has mobilized a technical staff of 10 and one administrator. The BNFL staff includes a project manager, a radiation safety officer, a health physicist and 5 health physics technicians, to provide the radiation and industrial safety functions during the decontamination and decommissioning project. In addition, there are two BNFL assistant project managers; one tasked with directing all physical operations of the project and one tasked with a technical support role. The inspector verified that the current oversight relationship between ABB Combustion Engineering and BNFL established a management organization that met all requirements of the license.

4.0 Training

The inspector reviewed the background and training status of the five contract health physics technicians and found that all five were previously employed at the CE fuel facility with an average experience level of 12 years. All had received the required radiation worker training within the past twelve months. The inspector had no further questions in this area.

5.0 Operations Review

The inspector toured the Nuclear Fuel Manufacturing Facility several times during the inspection period and observed only monitoring activities in progress. Emergency eye wash and body showers were located close to the nitric acid pickling tank and were operable at the time of this inspection. The inspector did not note any safety discrepancies.

6.0 Radiation Protection

The inspector reviewed implementation of the licensee's radiation protection program through review of records, and through discussions with personnel. This review was with respect to license requirements and federal regulations contained in 10 CFR Parts 19 and 20.

The inspector observed that each worker entering the pellet shop was issued a personal lapel air sampler. This was an excellent practice since this provides improvement over the license allowed use of general stationary air samplers to assess airborne contamination levels and personnel intakes. The pellet shop area (a contaminated area) was generally below 300 disintegrations per minute (dpm)/100 cm². This was less than one-tenth of the licensee's 5,000 dpm/100 cm² limit requiring cleanup within 24 hours. Radiation dose rates in the pellet shop averaged 0.1 - 2.5 mR/hr, with 11 mrad/hr beta dose rates found in close proximity to the fuel stacking table. The inspector determined that the radiological hazards were low and appropriate monitoring of radiation exposure was performed. Radiological postings and housekeeping controls were good.

The inspector reviewed selected radiation survey records and noted that they were of good quality and the required frequency of surveys was met. The clean area surveys of the Nuclear Fuel Manufacturing Facility routinely demonstrated low contamination levels. Selected lapel air sample records of pellet shop workers were reviewed and indicated relatively low exposures.

The inspector reviewed external radiation exposure results for licensee workers for 1993. Collective exposures were not compiled, although the inspector's review of the data indicated that the maximum exposure received during any one quarter of 1993

was 2120 mrem shallow dose equivalent (or skin exposure) and 490 mrem deep dose equivalent (or whole body exposure). The 1993 NRC regulations permitted any one individual to receive 3,000 mrem per quarter whole body dose (with radiation history documentation and assuming lifetime exposure constraints are not limiting) and 7,500 mrem per quarter skin exposure. The licensee did not have available collective radiation exposures for the 1993-1994 time period. The licensee had not yet reestablished after the 30-day deactivation of licensed activities, an ALARA program at the time of this inspection, but committed to establish one prior to resumption of decontamination activities.

Indirect measurement of internally deposited radionuclides in workers was accomplished by monthly urinalysis of those laboratory radiation workers who may handle soluble uranium, and annually for fuel facility radiation workers who only handle insoluble uranium. The 1993 through March 1994 results of all monitored individuals were < 1 microgram of uranium per liter of urine for each sample collected, indicating the results were at the lower limit of detection of the measurement system. Direct measurement of personnel radionuclide deposition was performed on 21 radiation workers on April 4-14, 1994, using a uranium sensitive lung counter with phoswich detectors. The maximum detected uranium deposition was 63 micrograms with a measurement error band of ± 40 micrograms. The NRC maximum permissible lung burden for uranium-235 is 250 micrograms. The license-specified action level for diagnostic urinalysis is at ≥ 175 micrograms of uranium-235. The above results substantiate the low exposures received by the facility's radiation workers.

7.0 Effluent Release

The inspector reviewed the licensee's 1993 effluent release data with respect to license requirements. The license limits gaseous effluent releases to 18 microcuries per calendar quarter based on gross alpha measurements. Liquid effluent releases to the Windsor site brook are limited to concentrations of ≤ 3 picocuries per milliliter (which represents 10% maximum permissible concentrations (MPC) for insoluble natural uranium).

Licensee supplied data indicated total gaseous effluent releases of 2.75 microcuries for all four quarters of 1993. The average release level represents 4% of the limit. Liquid effluent releases were batch releases. The license limits the concentration released. The licensee tracks total activity released rather than the discharge concentration. The raw data reviewed by the inspector did not indicate the volume of liquid discharged, and, therefore, the inspector could not determine if the concentrations were in accordance with the license condition. This item will be considered unresolved until the licensee provides the effluent liquid concentration information for the fourth quarter of 1993 and the first quarter of 1994 and this information can be reviewed by the NRC. (70-1100/94-01-02)

The inspector observed a sanitary waste transport truck loading sanitary sewage from the onsite facility to be taken to the Metropolitan District Commission public waste treatment facility. Upon questioning the licensee, the inspector determined that the sewage was not sampled or monitored for radioactivity. The licensee indicated that the sanitary sewage system was segregated from all industrial waste piping systems and, therefore, would not contain any radioactive material. The licensee was not able to provide the inspector with the applicable piping and instrumentation drawings during this inspection to verify system segregation. The inspector stated that the assurance that sanitary sewage is not radioactively contaminated will be considered unresolved until the licensee can provide documentation or other demonstration that contamination did not or could not occur. (70-1100/94-01-03)

8.0 Transportation

The inspector reviewed with the licensee, the qualifications for the authorized shipper and reviewed a typical shipping record from an April 27, 1994, shipment of depleted uranium fuel rods. The shipping records were determined to be complete and to meet the applicable requirements of 10 CFR Parts 20, 70, 71 and 49 CFR Parts 171-178. The current Radiation Safety Officer, Mr. J. Limbert, has had significant previous experience in providing radioactive shipments from the site and has assumed these responsibilities for future shipments from the site. No safety concerns or violations were identified.

9.0 Exit Meeting

The inspector met with licensee representatives at the end of the inspection, on May 18, 1994. The inspector reviewed the purpose and scope of the inspection and discussed the findings. The inspector informed Mr. J. Conant by telephone on May 26, 1994, of two unresolved items due to the lack of information supplied during the inspection. The licensee acknowledged the inspection findings.