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

REGION III

Report No. 27-39/80-01

Docket No. 27-39 License No. 13-10042-01

Licensee: Nuclear Engineering Company, Inc.
Post Office Box 7246
Louisville, KY 40207

Facility Name: Nuclear Engineering, Sheffield, IL Burial Facility

Inspection At: Sheffield, Illinois

Inspection Conducted: April 17, 1980

Inspectors: C. J. Paperiello 5/2/80
L. W. Shatterly 5/2/80

Approved by: C. J. Paperiello, Chief 5/2/80
Materials Radiological
Protection Section No. 1

Inspection Summary

Inspection on April 17, 1980 (Report No. 27-39/01)
Areas Inspected: Routine, unannounced inspection to determine compliance with requirements, including: Organizational changes, audits, security program, independent measurements, permanent sample stations, physical tour of the site, training program, personnel exposure control - external, internal, air sample program, instruments - calibration, trench construction and status of water erosion. The inspection involved ten inspector-hours onsite by two NRC inspectors.
Results: Of the areas inspected, no apparent items of noncompliance were identified.

DETAILS

1. Persons Contacted

*R. Moore, Site Manager
*A. Amburst, Site Radiological Control and Safety Officer

*Denotes those present at exit interview.

2. General

The purpose of this inspection was to determine if the licensee is conducting their Radiological Safety Program in accordance with their license requirements as stated in a letter of Mr. T. B. Conner, Washington, D.C. from USNRC dated April 23, 1979, and to observe the conditions of the site as to water erosion after the winter snows had melted. The results of our inspection indicated that the licensee is conducting their activities in accordance with pertinent regulations and NRC requirements. A follow-up to this inspection is planned in the near future.

3. Scope of Operations

The records indicate that the last date of waste burial in Trench 14-A was April 8, 1978, and no radioactive waste had been buried at the Sheffield, Illinois facility since that time nor was any radioactive waste noted as being stored on the ground. The licensee has not received any radioactive material at the Sheffield site since March 8, 1979. The licensee is performing caretaker functions.

4. Organization

The licensee's organizational structure and its responsibilities which pertain to the Sheffield, Illinois site are defined in the licensee's Radiological Controls and Safety for Burial Site Manual (RCS) and Site Operations Manual for Low Level RAD Waste Disposal at Sheffield, Illinois (SOM). These manuals were incorporated into the license by Amendment No. 11, dated January 6, 1977.

The following organizational changes have been made since the inspection conducted in July 1978. Dr. Thomas Baer, Vice President, is also the Vice President of Engineering and Safety. Mr. Sid Wright is a Vice President, Operations. Mr. David Buckner is a Vice President, Marketing and Mr. Walter Hipsher is the Chief Radiological Control and Safety Officer.

No items of noncompliance were identified.

5. Audits

a. Quarterly Audit

The licensee's quarterly audit as described in Section 4 of the RCS and Section 2 of the SOM is implemented and records of the audits were reviewed since the last inspection which consist in part of:

(1) Dosimetry Program;
(2) Radiological Control and Safety Training;
(3) Emergency Drills and Equipment;
(4) Working Procedures/Performance and Personnel Decon.;
(5) Radiological Survey and Posting;
(6) Radiation Instrumentation;
(7) Environmental Monitoring;
(8) Security, and General Condition of Burial Site.

b. Site Inspections

The licensee's quarterly site inspection requirements as described in the RCS and SOM were reviewed. Section 2.2.5 of the RCS requires that the Chief Radiological Control and Safety Officer spend a minimum of one to three days of every calendar quarter at the burial facility. These inspections were performed as required since the last inspection.

No items of noncompliance were identified.

6. Security Program

The licensee conducts a security program in accordance with Section 4.0 of the SOM except for those changes that were negotiated between NRC and NECO and documented in an agreement between both parties, dated April 23, 1979. The "After Shift and Weekend Log" was reviewed. The results of this review indicated the security program is being implemented.

Memo on file indicates that the Bureau County Sheriff's Department was notified, December 26, 1979 and 27 at 1700 hours and 0330 hours respectively, of damage to the site gas pump outside the secured burial area. No gas was taken since the electric switch controlling the pumps was turned
off.

No items of noncompliance were identified.

7. Instruments

A review of the licensee's records showed the licensee's radiation survey instruments, which are used to perform surveys in accordance

with the licensee's survey procedures (SI-004), are calibrated at approximately six month intervals as required. The instrumentation on hand includes alpha, beta and gamma instruments. Gamma instruments have ranges capable of detecting ambient background up to tens of R per hour.

No items of noncompliance were identified.

8. Training, Retraining, and Instruction to Workers

The licensee's training, retraining, and instruction to workers are described in the RCS and SOM as are all forms required for signature with reference to instructions and tests. No radiation worker's requalification tests were reviewed since the last inspection, none were scheduled. However, one site official is due for requalification in August 1980.

9. Personnel Radiation Protection - External

The licensee's radiation monitoring and personnel monitoring program as outlined in the RCS were reviewed during this inspection. The licensee uses monthly film badges for monitoring external whole body exposures for persons actively engaged in the program. There are currently only six individuals badged. The film badges are supplied by Landauer Company. The licensee maintains copies of Form AEC-5, AEC-4, State of Illinois Form RMA-1, and the reports from the film badge supplier. These records were reviewed for the first quarter, 1980. Whole body exposures were minimal.

A review of the licensee's direct surveys since the last inspection indicated that daily surveys are made of the maintenance shop, office, lunch room, and change room areas. The records showed no radiation levels above 100 counts per minute above background.

No items of noncompliance were identified.

10. Personnel Radiation Protection - Internal

The licensee's bioassay program consists of performing urinalyses of all radiation workers on a quarterly frequency. This program includes gamma isotopic, uranium, and tritium analyses. The licensee does not perform analyses for gross beta and gross alpha emitters. No problems were noted.

No items of noncompliance were identified.

11. Air Sample Program

The licensee takes weekly air samples of the yard outside the main building by drawing air through a sample tube at a rate of 5 ft^3/

minute using a stationary pump inside the building. The results of these samples were reviewed and indicated concentrations below 10 CFR Part 20, Appendix B limits. In addition, the licensee has taken tritium samples using a tritium bubbler plus a filter system for air particulates in the chemistry safety trailer station-W and a separate filter system at the safety trailer site, Station-U, the records for these samples were reviewed for sample collected, since the last inspection.

No items of noncompliance were identified.

12. Permanent Sample Stations and On-Site Environmental

The licensee's permanent sump, surface runoff and water sample stations records were examined. The licensee has performed weekly permanent sump, surface runoff and water sample stations monitoring as required.

It was noted by the inspection team the results of one set of NECO environmental samples involving tritium analysis of water and vegetation was unusual since the tritium concentration found in the water within the vegetation was higher than the nearby water in which the vegetation grew. This item will be reviewed more fully at the next inspection.

No items of noncompliance were identified.

13. Trench Inspection

Trench inspection is required quarterly; however, the licensee has chosen to inspect at more frequent intervals. Results of these inspections are as follows:

a. 10-11-79 Identification survey.

b. 12-26-79 Identification survey.

c. 1-18-80 Depression 4' wide by 2' deep at monument and sump pipe T25C.

d. 1-30-80 No holes identified.

e. 2-29-80 Snow cover, no holes identified.

f. 3-12-80 No holes - all trenches.

g. 3-28-80 No holes - all trenches.

No items of noncompliance were identified.

14. Tour of the Twenty Acre Burial Site

On April 14, 1980 a wet 6-inch (+) snow fell at the burial site and immediate Sheffield area. Clearing skies and moderating temperatures during the next two days resulted in excessive snow melt (estimated 99.9%) and water runoffs. The inspection team toured the burial site during the inspection and observed the following freshly developed holes:

a. Extreme SW corner trench-11, hole approximately 1.5' diameter by 1.0' deep with no measurable radiation at perimeter or bottom.

b. Between trenches 7 and 6, midway from either end, hole approximately 2' diameter by 2' deep, with no measurable radiation at perimeter or bottom.

c. Midway atop trench-7, hole approximately 3' diameter by 2' deep with 0.5 mR/hr readings at bottom of hole using GM instrument. (Similar readings with window opened or closed.)

d. SW side near end of trench-3 hole approximately 3' wide, 4' long, and 3' deep with no detectable radiation.

e. Atop trench-25C near eastern end, hole 1.5' diameter by 1.5' deep with no detectable radiation. Trench marker sinking.

During the tour fresh soil erosion areas were observed:

a. Although there appeared to be a good stand of new short rooted grass along the SW hillside between trenches 7 and 11, numerous small washes (3" wide by 1.5" deep) along side of hill will require attention this spring due to the young and newly rooted grass in this hillside.

b. Along the top of the north hillside near the western extremity of well No. 528, a runoff gully has developed due to moderate erosion.

c. Along a north-south line west of trenches 4, 6B, 24, and 23, a large gully has recently developed.

Along the northeastern fence corner a small 2' x 1' triangular hole was noted beneath the fence caused by melting snow and water erosion. To close the hole the licensee plans to drive metal rods into the soil beneath the fence at intervals close enough to deny entry at this point.

The holes and gullies cited above do not appear to have resulted in serious damage to the burial site, security, or other potential

hazards. This is due to their recent appearance. However, corrective measures must be immediately initiated to prevent further soil erosion and restore the original status of the burial site.

Due to the muddy and unstable condition of the wet soil, caused by rains and snows this winter, it was not practical for the licensee to move bulldozers and loaded trucks inside the fenced burial site to correct these eroded areas since their weight would have made a bad situation worse by chewing up the soil and promoting more serious erosions than the originals. However, prior to departing the burial site, the inspection team was informed by the licensee that fill was to be placed immediately into those holes previously identified and into any others found. In addition, as soon as the soil is dry enough to support the movement of heavy equipment, gullies will be filled by the licensee and attempts made to prevent further occurrances. These items will be reviewed for corrective action by the USNRC at its next visit. Photographs were made as sources of comparison. See enclosures 1-5.

15. Independent Measurements

Water samples were taken inside the burial site from USGS' wells Nos. 523 and 528, NECO's well, outside, located near extreme southeast corner of fenced area, and from runoff in the same general vicinity as the NECO well. These samples were split with the licensee. The NRC will forward their samples to USDOE, Idaho Falls, Idaho for gross beta and gamma, tritium, strontium-90 and isotopic gamma analysis. The results will be reviewed at a later visit.

Other measurements were performed using a GM Eberline Instrument (beta-gamma) Model E-500B (0-2R/hr range) NRC No. 000704, calibrated 4-5-80 and a Thyac II Victoreen survey gamma scintillation detector, Model 489 (0-8 mr/hr range), NRC No. 000706, calibrated 3-15-80. See paragraph 14 above for results.

16. Management Exit Interview

Those areas inspected during this inspection as outlined in the Details of this report were discussed with personnel (denoted by the asterisk in Paragraph 1) on April 17, 1980.

The following items were specifically discussed at this meeting:

a. Status of the burial site after winter and the results. In comparison to a similar period last year the burial site and security fence has sustained minimal erosion and damage.

b. Water samples collected and results of licensee's environmental tritium analysis.