

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-317/92-13
50-318/92-13

Docket No. 50-317
50-318

License No. DPR-53
DPR-69

Licensee: Baltimore Gas and Electric Company
Post Office Box 1475
Baltimore, Maryland 21203

Facility Name: Calvert Cliffs Nuclear Power Plant, Units 1 and 2

Inspection At: Lusby, Maryland

Inspection Conducted: April 13-17, 1992

Inspector:



J. Furia, Senior Radiation Specialist,
Facilities Radiation Protection Section (FRPS),
Facilities Radiological Safety and Safeguards
Branch (FRSSB), Division of Radiation Safety
and Safeguards (DRSS)

4/21/92
date

Approved by:



W. Pasciak, Chief, FRPS, FRSSB, DRSS

4-21-92
date

Areas Inspected: Announced inspection of the radiation protection and transportation program including: management organization, assurance of quality, radiation control during outage operations, transportation, and implementation of the above programs.

Results: Continued strong performance in ALARA, together with improved radiological housekeeping were also noted. Within the areas inspected, one violation in the area of transportation (Section 4) was identified. This violation involved the improper manifesting of five spent resin shipments for disposal, due to erroneous data supplied by the Chemistry Department to the Materials Processing Section.

DETAILS

1. Personnel Contacted

1.1 Licensee Personnel

- W. Coursey, Radiological Controls Shift Supervisor
- * P. Crinigan, General Supervisor - Chemistry
- R. Franke, Compliance Engineer
- * C. Gradle, Compliance Engineer
- * S. Hutson, Supervisor, Radiological Control - Operations
- * P. Katz, Superintendent - Technical Support
- * J. Lenhart, Supervisor, Materials Processing
- * G. Phair, Assistant General Supervisor, Radiological Control and Support
- * M. Rigsby, Plant Health Physicist
- * S. Sanders, Supervisor - Plant Chemistry
- * J. Wood, Senior Engineer, Quality Audits Unit
- P. Wright, Supervisor, Radiological Controls - ALARA

1.2 NRC Personnel

- A. Howe, Resident Inspector
- C. Lyon, Resident Inspector
- P. Wilson, Senior Resident Inspector

* Denotes those present at the exit interview on April 17, 1992.

2. Purpose

The purpose of this safety and health inspection was to review the licensee's programs for radiation safety during outage operations and transportation.

3. Radiation Safety

On March 19, 1992, the licensee entered its refueling outage 1-R-10, for Unit 1. This was the first refueling outage the licensee had conducted since its extended shutdown. As part of this inspection, numerous plant tours and interviews were conducted to evaluate the licensee's program for radiation safety during this outage, including control of work activities, radiological housekeeping, and ALARA.

3.1 ALARA

The licensee established an ALARA goal for the refueling outage of 194 Person-Rem. As of the end of this inspection, total dose was approximately 60 Person-Rem, which was on target with the predicted 60-65 Person-Rem for this stage of the outage. The major dose intensive jobs to be

performed during the outage included the refueling path and eddy current testing of the steam generators, with the plugging of tubes and the replacement of some older tube plugs also to be accomplished.

As part of its ALARA plan for this outage, the licensee conducted extensive mock-up training of workers who would be involved in the steam generator work, including the installation and removal of nozzle dams. This training was evident in the accomplishment of the nozzle dam installation and steam generator preparatory work for some 2 Person-Rem less than projected. The licensee had also assigned its ALARA technicians to perform ALARA functions only during the outage, and did not require them to perform job coverage or serve as area coordinators. This allowed the ALARA technicians the opportunity to follow jobs from an ALARA perspective throughout the entire outage. Each technician has been assigned specific job paths to monitor during the outage, and periodic reports to be prepared for their respective job paths. The first of these reports was due to the ALARA supervisor the week of April 20, and will be reviewed by the inspector during the next inspection of this area.

The licensee has continued its aggressive program for the reduction of Personnel Contamination Incidents (PCIs). As part of this inspection, a review of the licensee's program, including attendance at its weekly PCI meeting, and a review of its 1991 PCI annual summary were conducted. Those in attendance at the PCI weekly meeting included the Radiological Controls - Operations Supervisor, the Assistant General Supervisor for Radiological Control and Support, and the Technical Support Manager. In depth discussions were held on each PCI which had occurred since the last meeting, and action items and recommendations made as appropriate. The 1991 PCI report included both a listing of successful actions taken during the year, and a discussion of long term actions. The licensee's strong commitment in the area of PCI reductions has led to a significant reduction in the number of PCIs over the past three years.

3.2 Radiological Operations

For the refueling outage, the licensee augmented its radiological controls, Nuclear Plant Support and Dosimetry staffs with a number of contractor personnel. In the Radcon Operations area, a total of 54 contract technicians were hired. Contract Dosimetry staff were manning the access desk, while plant Nuclear Support personnel attempted to keep control of the radiological housekeeping problems associated with a refueling outage.

As part of this inspection, several tours of the licensee's Radiologically Controlled Area (RCA) were made, especially in the Unit 1 Containment and

in the Auxiliary Building. Despite the large number of jobs in progress throughout the RCA, radiological housekeeping was found to be generally very good, with few instances of poor housekeeping noted. As during normal operations, each level of the Auxiliary Building was assigned a lead technician to support various jobs not requiring constant radcon technician coverage. Jobs requiring constant coverage were assigned to individual, qualified licensee or contract technicians as appropriate.

During the course of this inspection, several jobs were observed being performed in the Unit 1 Containment, including steam generator testing (both hot and cold side), removal of the reactor Upper Guide Structure (UGS), removal of In Core Instrumentation (ICI), scaffold erection, and the removal of insulation from plant piping. Constant job coverage of steam generator hot and cold side work was accomplished via the use of closed circuit television and dedicated communications, so as to reduce the total dose spent on this dose intensive job. Constant coverage was also observed being provided for the UGS and ICI work, while spot coverage was provided to the scaffold and insulation work. Job coverage by the radcon technicians was determined to be very good. To aid in ensuring proper job coverage, the licensee had established a containment control point on the 69' elevation, along with a satellite station at the 10' elevation. Each work group entering the containment was required to check in at the 69' station, where they were logged in, given a briefing on radiological conditions, and assigned a radcon technician to provide job coverage as necessary.

In the case of the ICI removals, four or five radcon technicians were assigned job coverage for each removal, with the technicians providing coverage both on the ICI bridge structure, and around the reactor cavity pool. Radcon actions included setting an underwater detector adjacent to the ICI guide tube being worked on so as to be able to detect when the fission chamber was near the end of the tube. This allowed for appropriate ALARA activities to commence, including withdrawing personnel from the immediate area. Radcon job control for this activity was determined to be generally very good. One concern identified was a need for greater control of access to the refueling pool area while the ICIs were being pulled. Other work groups, not associated with the ICI work were observed touring the pool area, sometimes coming up to the ICI bridge, and then having to be chased away by the radcon technicians supporting the ICI work. Greater access control into the refueling pool area would greatly reduce the potential for other work groups to pick up unnecessary dose from being in the area of an ICI pull.

While no weaknesses of radiological safety were noted during the inspection, several weaknesses in the area of general personnel safety were noted. Of greatest concern was the failure of licensee personnel to attach their safety

harnesses while working around the reactor cavity pool prior to the installation of a guardrail. Even after being approached by a Radcon Shift Supervisor, one individual directing the overhead crane during the UGS lift, continued to leave his harness unattached for extended periods of time, even while leaning out over the pool edge to make observations of the work in progress. Another individual was observed down on the 10' elevation without safety glasses as required by plant policy, the 10' elevation being two levels below the containment personnel access hatch.

Also noted were several areas where improvements in performance could be made. These included limiting the number of personnel removing their protective clothing (PCs) at the same time at the containment personnel hatch. Several instances of personnel brushing against one another while removing their PCs were noted by the inspector. Crowding in this manner can lead to the spread of contamination onto personal clothing, and an increase in PCIs. Also noted were personnel who were delayed for an extended period of time at the containment personnel hatch, who entered the potentially contaminated undressing area by the hatch in order to remove their PCs. These personnel had not as yet entered a contaminated area, but rather had tired of waiting for access to the containment, and were removing their PCs in order to then exit the RCA. Entering the potentially contaminated undressing area can only lead to increased PCIs, excess laundry to be cleaned, and additional radwaste.

4. Transportation

In March, 1991, the licensee replaced its existing gamma spectroscopy system with a new system. Included in the functions this new system was expected to perform was the analysis of spent resin samples taken from materials that were to be shipped for disposal at the Barnwell Waste Management Facility in Barnwell, South Carolina. In setting this new spectroscopy system up for use, licensee personnel incorrectly established the parameters for this spent resin analysis such that while the system would calculate results in terms of microcuries per gram (uCi/gm), the print out from the system would indicate that the results were microcuries per cubic centimeter (uCi/cc). Previous licensee analysis had indicated that these two values were in fact different by a factor of 0.8. The erroneous values from the gamma spectroscopy system printout were then forwarded to the Materials Processing Section for use in preparing the transportation shipping papers and waste manifest. Subsequently, the licensee made five shipments of spent resin: 91-043 (6/14/91); 91-064 (10/21/91); 91-078 (10/30/91); 92-003 (1/31/92); and 92-008 (2/13/92), all utilizing the erroneous data. As a result, the total activity listed for each shipment, along with most of the individual radionuclide activities were erroneous. This error was in the conservative direction, resulting in over reporting the total activity of each shipment by 20%. Improper manifesting of a radioactive waste shipment is an apparent violation of both 49 CFR 172.203 and 10 CFR 20.311 (50-317/92-13-01; 50-318/92-13-01).

Only one shipment of spent resin, 91-046 (6/28/91), was made correctly. Prior to the Chemistry Department forwarding the gamma spectroscopy results for the resin sample from this shipment, a Chemistry Technician, while reviewing this particular data printout, discovered the error, and made a pen and ink change on the printout to correct the units of measure. The technician failed, however, to then notify his supervisor of this discovery, or to request that the printout be changed.

5. Exit Interview

The inspector met with licensee representatives denoted in Section 1 at the conclusion of the inspection on April 17, 1992. The inspector summarized the purpose, scope and findings of the inspection.