

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-317/94-01
50-318/94-01

Docket No. 50-317
50-318


License No. DPR-53
DPR-69

Licensee: Baltimore Gas and Electric Company
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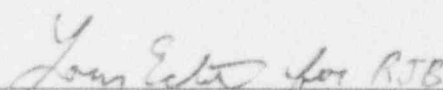
Facility Name: Calvert Cliffs Nuclear Power Plant, Units 1 and 2

Inspection At: Lusby, Maryland

Inspection Conducted: January 3-7, 1994

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) 1-10-94
date

Approved by: 

R. Bores, Chief, FRPS, FRSSB, DRSS 1/11/94
date

Areas Inspected: Areas inspected include programs for: maintaining occupational exposure to ionizing radiation as low as reasonably achievable (ALARA), radiation safety during normal operations, radiological work control and housekeeping. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Results: ALARA preparations for the upcoming Unit-1 refueling outage (RF-11) were considerably further advanced than those preparations for last years Unit-2 outage (RF-09). Continued emphasis by senior management in this area is needed to continue these programmatic improvements. One non-cited violation was identified in the radiological controls area, involving exceeding a Calvert Cliffs administrative exposure limit during a spent resin packaging evolution.

DETAILS

1. Personnel Contacted

1.1 Licensee Personnel

- * P. Chabot, Superintendent, Technical Support
- W. Coursey, Principle Technician - ALARA
- * C. Cruse, Plant General Manager
- * C. Gradle, Compliance Engineer
- * S. Hutson, Supervisor, Radiation Control - Operations
- M. Kratz, Acting Supervisor - Dosimetry
- * G. Phair, Assistant General Supervisor, Radiation Control and Support
- * B. Watson, General Supervisor - Radiation Safety
- * J. Wood, Quality Assurance Engineer
- * R. Wyvill, Supervisor, Radiation Control - ALARA

1.2 NRC Personnel

- K. Lathrop, Resident Inspector
- F. Lyon, Resident Inspector
- * P. Wilson, Senior Resident Inspector

* Denotes those present at the exit interview on January 7, 1994.

2. Radiation Safety

Since the last inspection in this area, the licensee has undertaken a reorganization of the Radiation Safety organization, reducing the number of personnel reporting directly to the General Supervisor - Radiation Safety (GSRs), and splitting the organization into those functions operating inside the protected area from those operating outside the protected area. Two Assistant General Supervisors (AGS) now report to the GSRs, with one AGS responsible for Radiation Controls - Operations, Radiation Controls - ALARA, and Plant Support, while the other AGS is responsible for Dosimetry, Materials Processing, and Site Support. At the time of this inspection, all supervisory positions within this organization were at least temporarily filled. Final filling of supervisory positions was scheduled to be completed following the Unit-1 refueling outage.

2.1 Maintaining Occupational Exposures ALARA

For 1993, the licensee's established occupational goal of 320 person-rem was exceeded by approximately 100 person-rem. The most significant contributor to this additional exposure was the Unit-2 refueling outage (RF-09), and the particular causes of this have been discussed in previous inspection reports. Notable among these causes were the failure to schedule work in advance, the failure to freeze work scope, improper ALARA reviews of planned work, lack of in-process ALARA reviews of work, and a significant

radiological challenge to the ALARA program during the outage. Specifically, the significant challenge was the gross contamination of the containment due to a combination of problems involving the Containment Air Coolers (CACs) and the presence of large boric acid crystals on seven of the eight In-Core Instrumentation (ICI) flanges under the reactor head shroud.

In preparation for RF-11, scheduled to begin February 4, 1994, the licensee has made considerable progress in addressing the significant issues listed above. Scheduling of work for the outage was considerably ahead of last year, with greater than 80% of the maintenance order packages completed by the conclusion of this inspection. At the time of the start of RF-09 last year, only 70% of the maintenance order packages were completed. More significant for ALARA is the preparation of more than 160 Special Work Permits (SWPs) in support of outage work, together with their ALARA reviews, as necessary. These SWPs cover all work anticipated for the outage, whether or not the maintenance order is completed as yet. At the time of this inspection, more than 150 of these SWPs had been completely staged, and the remaining were in a form that could be rapidly completed once final maintenance orders were prepared and scheduled. Much of this improvement in ALARA preparation for the outage can be traced to the placement of a Senior Radiation Safety Technician (RST) from the ALARA group into the outage planning organization last year.

At the time of this inspection, work to be performed during the outage had been effectively frozen, with any additional work requiring the approval of the Plant General Manager in order for it to be added to the outage scope. Discussions with the Supervisor, Radiological Controls - Operations indicated that with the preplanning of the outage now largely completed, ALARA RSTs would be sent into the Radiologically Restricted Area during the entire outage to perform in-process reviews of work, and that the results of these reviews would be provided to the appropriate work supervisors. In addition, the Supervisor will be conducting training sessions for project managers and senior work leaders beginning the week of January 17th, so that they become more aware of the ALARA concept and can conduct their own in-process work reviews, in addition to those conducted by ALARA. The success of this initiative will be evaluated during an outage inspection.

For all of 1994, the licensee has established an exposure goal of 405 person-rem. This includes 72 person-rem for normal operations, 13 person-rem for forced outages and a surveillance outage in the fall, 20 person-rem for the transfer of spent fuel from the spent fuel pool to the Interim Spent Fuel Storage Facility (ISFSI), and 300 person-rem for RF-11. For the outage, the baseline outage goal for the refueling path, removal of boric acid crystals from the ICI flanges, steam generator and reactor coolant pump maintenance, and in-service inspections (ISI), has been established at 210 person-rem. The exposure goal for plant modifications, including the nickel plating of the pressurizer heater sleeves and the installation of a neutron shield around the reactor, has been established at 81 person-rem, and a contingency work goal of 9 person-rem has also been established. As

part of this goal establishment, the license issued in December 1993 a pre-outage ALARA report, the first time the licensee has ever written and issued such a report. Specific exposure goals are as follows:

<u>JOB</u>	<u>EXPOSURE GOAL (REM)</u>
Refueling Path	84.0
Steam Generator Maintenance	19.0
Reactor Coolant Pump Maintenance	13.0
Valve Maintenance	12.0
ISI/Snubber Inspections	9.5
Containment Decontamination	15.0
Radiation Safety Support	20.0
Minor Maintenance	20.0
Miscellaneous	17.5
Pressurizer Nickel Plating	40.0
Neutron Shield	15.0
Replace Safety Injection Valves	4.5
Reinsulate Containment	4.0
Replace Oil Level Transmitter	4.0
Relocate UGS Lift Rig	2.6
Replace Limit Switches	2.5
CVC 519 By-Pass	2.4
Other Modifications	6.0
Contingency Work	9.0

Jobs and projects of particular note in the ALARA report include the containment decontamination, pressurizer work and the installation of the neutron shield. During the 1993 RF-09 in Unit-2, the licensee discovered millirad smearable contamination throughout the containment due to the leaking ICI flanges and the problems with the CACs. For RF-11, the licensee has established a five day window of critical path time for the decontamination of the containment, including all elevations up to eight feet, the polar crane, the pump bays, and the reactor head and shroud. Approximately 100 contractor personnel and volunteer plant staff will be involved in this effort. Also included in this decontamination effort will be the cleaning of the CACs. During previous outages this project has taken more than 30 days to complete, while during this outage, it is scheduled for completion within the five day decon window. The success of this effort will be evaluated during a future outage inspection.

The pressurizer nickel plating work is to be performed in hopes of preventing the stress corrosion cracking found in the Unit-2 heater sleeves several years ago, which required replacement of all the heater sleeves, with a resultant total exposure of 120 rem. Thus this early intervention at Unit-1 should result in a net savings of 80 rem of exposure to the plant staff. The neutron shield is a modification first proposed in 1983 to address the

high neutron dose rates measured on the 69' elevation of the containment during power entries. During an operating year, the licensee staff typically experienced total exposures of 7 rem per year neutrons per unit. In addition, the removal of the water bags currently utilized as a neutron shield typically led to an exposure of 15 rem per unit per refueling outage. The new neutron shield is estimated to be removed and reinstalled during an outage for only 1 rem of exposure.

2.2 Radiological Work Control

At the time of this inspection, both units were operating at or near 100% of rated power, with no major projects being conducted in the radiation restricted areas of the plant. As part of this inspection, a review of the circumstances surrounding an administrative overexposure of a Materials Processing (MatPro) Technician on November 30, 1993 was conducted. On November 30th, a MatPro Technician entered the spent resin cask pit below the 45' elevation of the Auxiliary Building (a portion of the radiation restricted area) to remove the fill head and place the lid on the liner containing processed spent chemical and volume control system (CVCS) resins located inside a shielded process cask. Dose rates at the open lid of the liner were 20 Rad per hour (20 R/hr), and the work was performed under SWP 93-276. Plant Technical Specifications require adherence to radiological protection procedures, and through these procedures, the SWPs issued for working in radiation restricted areas. This SWP had an administrative limit of 500 millirem exposure per individual per shift, and under the policies and procedures of the Radiation safety Department, as outlined in the Job Coverage Standard (JCS) 022, stay times for workers entering the cask pit were to be calculated by the RST covering the job and conveyed to the workers. The stay time for the worker entering the pit was never formally calculated, nor was it conveyed to the worker. When the worker experienced some difficulty in aligning the liner lid, he requested additional time, estimated to be 15-20 seconds to complete his task. This was approved by the coverage RST, in spite of the fact that the coverage RST believed that the worker was coming very close to the 500 millirem exposure limit. As a result, the workers dose was determined to be 620 millirem for this work evolution. The licensee took short term corrective actions, including reprimanding both the worker and the coverage RST, and began a review of work practices involving MatPro evolutions in the Auxiliary Building. Results of this review have been documented in the Issue Report (#IRO-0160-766) for this event, in a memorandum from the GSRS to his two AGS, and in an ALARA review of the work. Due to the prompt and thorough corrective actions taken by the licensee, the self-identification of the event, and the safety significance of the event, in accordance with Title 10, Code of Federal Regulations (CFR), Part 2, Appendix C, the NRC is exercising its discretionary authority and not citing this violation.

As part of this inspection, a preliminary review of the licensee's implementation of the revised 10 CFR Part 20, which became effective on January 1, 1994 was conducted. as a result of this review, a discrepancy in the licensee's procedure for area posting and barricading was identified. Specifically, in Procedure RSP 1-104, Paragraph 6.3, a

Radiation Area is defined consistent with 10 CFR Part 20.1003 (If the general area dose rate exceeds 5 mRem/hr, then post as a Radiation Area). However, Paragraph 6.2.B of this same procedure requires the posting of most of the Auxiliary Building and the materials Processing facility as a Radiation Area, regardless of the general area dose rates. This item remains unresolved, pending licensee review and correction of Procedure RSP 1-104 (50-317/94-01-01; 50-318/94-01-01).

3. Exit Interview

The inspector met with the licensee representatives denoted in Section 1 at the conclusion of the inspection on January 7, 1994. The inspector summarized the purpose, scope and findings of the inspection. The licensee acknowledged the findings of the inspection.