

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-315/94015(DRSS); 50-316/94015(DRSS)

Docket Nos. 50-315; 50-316

License Nos. DPR-58; DPR-74

Licensee: Indiana Michigan Power Company  
1 Riverside Plaza  
Columbus, OH 43216

Facility Name: D. C. Cook Nuclear Plant, Units 1 and 2

Inspection At: D. C. Cook Site, Bridgman, Michigan

Inspection Conducted: July 11 through 15, 1994

Inspector: *R. A. Paul*  
R. A. Paul

8/5/94  
Date

Inspector: *R. L. Hague*  
R. L. Hague

8/5/94  
Date

Approved By: *J. W. McCormick-Berges*  
Chief  
Radiological Programs Section

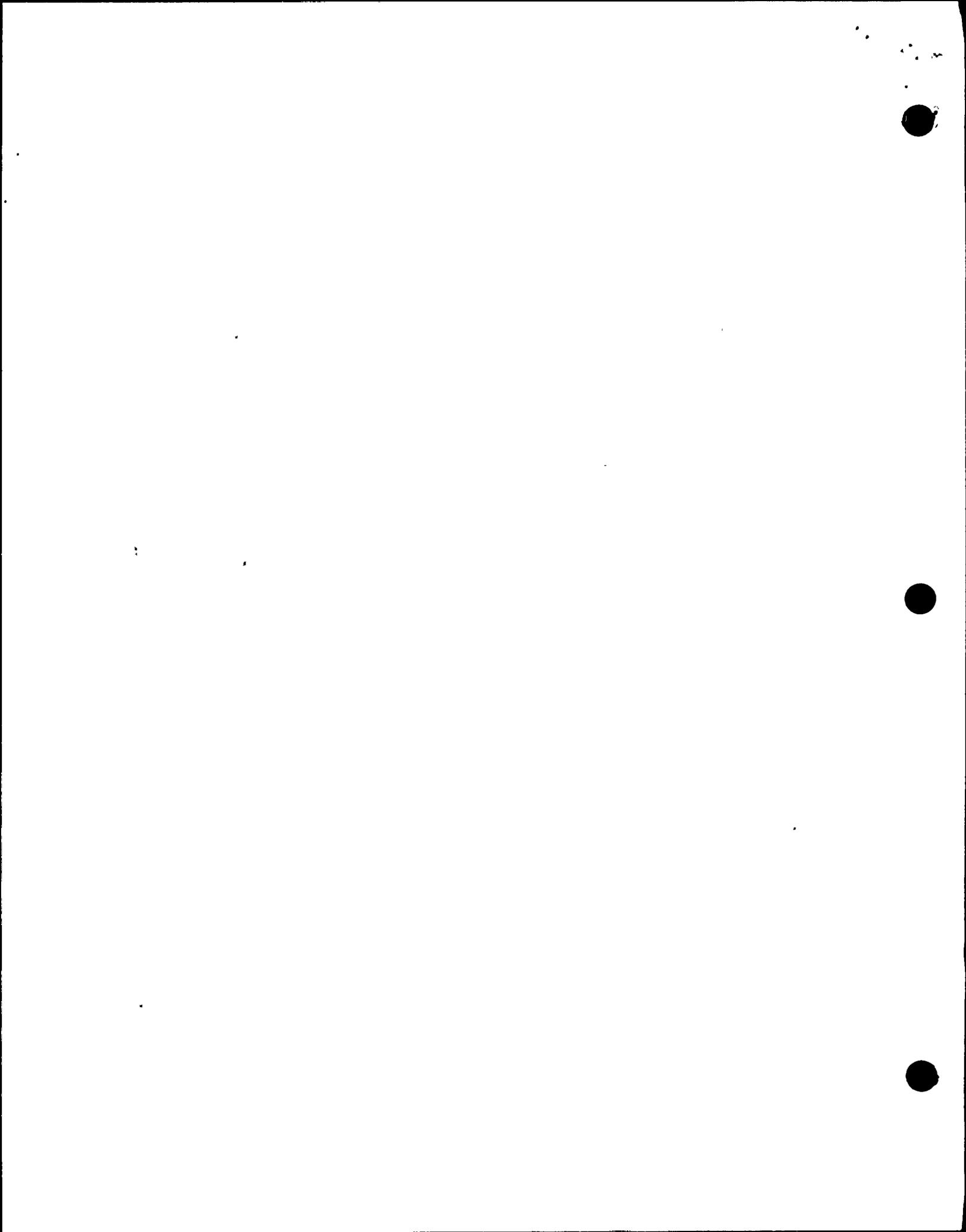
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Inspection Summary

Inspection on July 11 through 15, 1994 (Report Nos. 50-315/94015(DRSS) and 50-316/94015(DRSS))

Areas Inspected: Routine inspection of licensee's radiation protection program (IP 83750), including, internal exposure, outage ALARA, and contamination control. In addition, the inspectors reviewed the licensee's implementation of the new 10CFR Part 20, TI 2515/123, and made several tours of the plant.

Results: The licensee's radiation protection program was generally well conducted. Station cleanliness and material condition was good but radiological control problems were identified in some areas of the auxiliary building and the instrument control shop. Overall, the radiation protection program appeared to be effective, and sufficient preparatory attention appeared to have been given to the major radiation exposure jobs for the fall outage (U2R94).



## DETAILS

### 1. Persons Contacted

- \*K. Baker, Assistant Plant Manager, Production
  - \*W. Flaga, Maintenance Production Supervisor
  - \*L. Gibson, Assistant Plant Manager, Technical
  - \*P. Hoppe, Radiation Protection Controls
  - \*D. Morey, Superintendent Chemistry
  - \*D. Noble, Superintendent Radiation Protection
  - \*J. Rutkowski, Assistant Plant Manager, Support
  - \*H. Springer, ALARA Supervisor
  - \*M. Snyder, RP/HP Engineer
  - \*R. White, SNS-Manager
  - \*J. Wiebe, Superintendent Quality Assurance and Control
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- \*J. Isom, Senior Resident Inspector
  - \*D. Hartland, Resident Inspector

The inspectors also interviewed other licensee personnel in various departments in the course of the inspection.

\*Present at the Exit Meeting on July 15, 1994

### 2. Followup on Previous Inspection Findings

(Closed) Inspection Followup Item (Report No. 50-315/94011-01(DRSS): 316/94011-01(DRSS)): This issue was addressed in Section 9.2 of the above report and concerned the adequacy of corrective actions in the licensee's radioactive material shipping program. Further review of this item disclosed that corrective actions for earlier events were adequate to prevent recurrence and that later condition reports referenced the wrong procedure as being inadequate. This item is considered closed.

### 3. External Exposure Control (83750)

The licensee read their TLDs with an in-house installed system which was National Voluntary Accreditation Program (NVLAP) certified in eight categories. Sets of the TLDs were routinely spiked with gamma, neutron, and beta irradiations by a contract vendor. The results of the spiked samples were part of an interlaboratory comparison study which was used to ensure that all processing maintained consistent performance. The NVLAP tolerance limit for all categories was 0.5 and for the D. C. Cook station more conservative tolerance limits were used to investigate results falling outside those limits. A review of the NVLAP test data for 1993 and 1994 indicates all results were within the NVLAP tolerance limits.

No violations or deviations were identified.

4. Implementation of the Revised 10 CFR Part 20 (TI 2515/123)

The inspectors reviewed the licensee's implementation of the revised 10 CFR Part 20 regulations to ensure the establishment of effective programmatic controls with respect to high and very high radiation areas (HRAs and VHRAs), declared pregnant worker (DPW) and dose to embryo/fetus, planned special exposures (PSEs), and maintaining total effective dose equivalent (TEDE) as low as reasonably achievable (ALARA). The licensee implemented the revised Part 20 on January 1, 1994, and has had one refueling outage since implementation.

a. Control of HRAs and VHRAs

The original training for RTs was provided by a contractor. The licensee then based their lesson plans for general employee training and retraining on the material provided by the contractor. The inspectors reviewed the lesson plans and interviewed both RTs and other plant staff and verified adequate knowledge of the training material. The licensee's written procedures were based on the guidance of Regulatory Guide 8.38, Control of Access to High and Very High Radiation Areas in Nuclear Power Plants. All procedures were in place and appropriate training completed prior to January 1, 1994.

The licensee controls five areas in the plant as very high radiation areas under certain conditions. These areas are under the vessel with the thimbles withdrawn in both units, the fuel transfer tube rooms during fuel transfer in both units, and the demineralizer compartments on the 617 foot elevation of the auxiliary building. All of these areas were locked with special keys under the control of the duty radiation protection supervisor and requiring the signature of the radiation protection manager for release. The licensee's procedures required a radiation protection technician to accompany anyone who enters these areas. These controls were considered adequate.

The inspectors reviewed the administrative, refueling, and health physics procedures covering transient and potential high or very high radiation areas. These procedures appeared to be adequate to prevent the inadvertent or undetected creation of such an area.

b. DPW and Dose to Embryo/Fetus

Since the implementation of the revised Part 20, there have been three DPW at the station. The licensee's procedures included a declaration form and calculation sheet to calculate allowed dose. The licensee equalized dose over the gestation period by limiting dose on a monthly bases. If the DPW met or exceeded her monthly limit her key card would not permit further access to the controlled area.

The inspectors interviewed four women to ascertain what training they had received with regard to the revised Part 20, their rights to declare and undeclared pregnancy, and the lower limits imposed for the embryo/fetus. All four remembered receiving the training and that it was their right to declare pregnancy voluntarily by notifying their supervisor. Knowledge of other specifics of the training varied among the four women.

The licensee had a procedure in place for the calculation of dose to the embryo/fetus. The licensee's procedures were reviewed and appeared to be adequate.

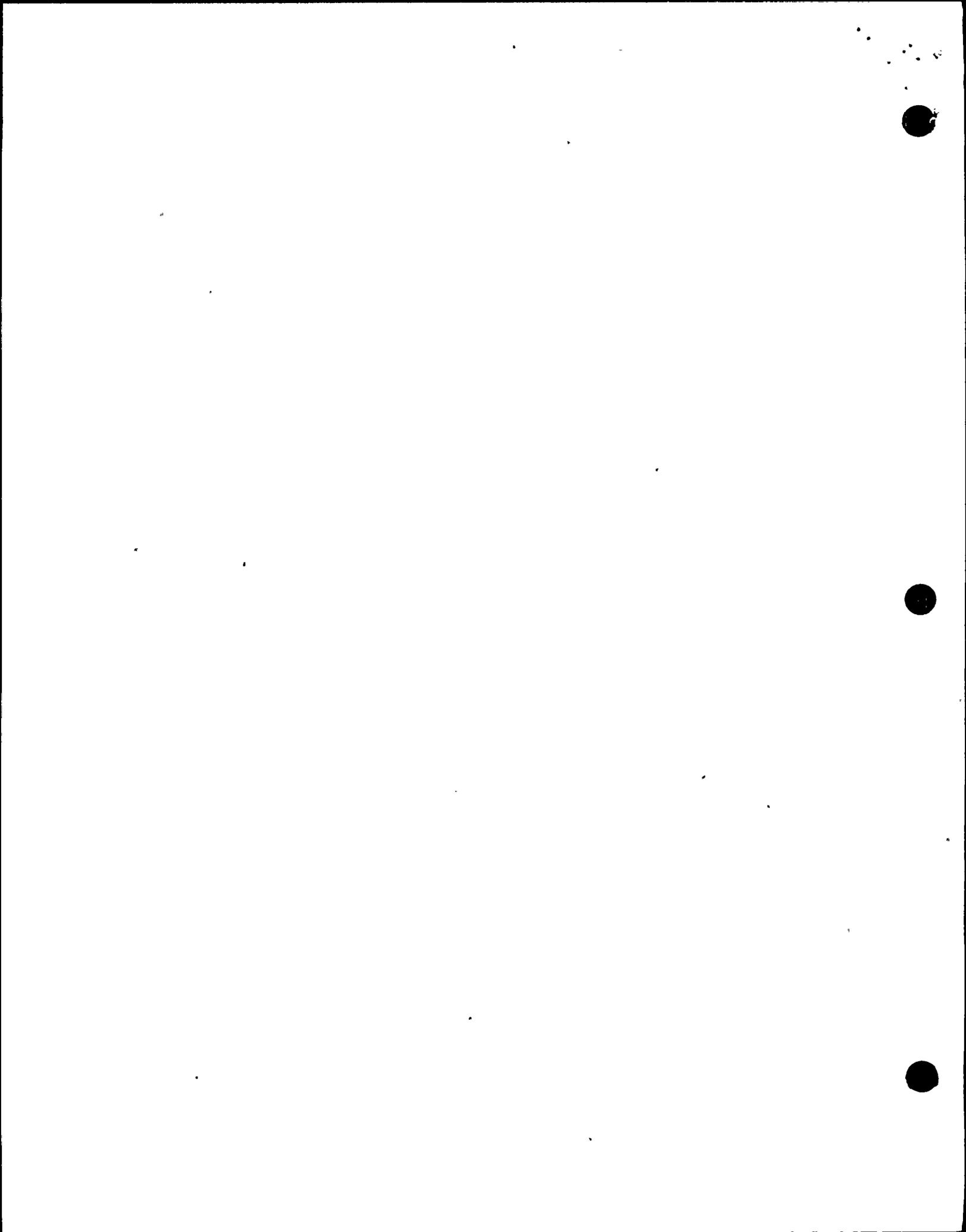
c. PSEs

The licensee's procedure for approval of PSEs paraphrased 10 CFR 20.1206 and designated the Senior Vice President-Nuclear as the approving official. There were no PSEs authorized to date and the licensee did not foresee the need to utilize this procedure in the future.

d. Maintaining TEDE ALARA

During this outage the licensee took steps to reduce the total effective dose equivalent (TEDE) by reduced use of respirators. To evaluate the potential internal dose they used previous air sample data and lapel air sample data obtained during the current outage. The inspector reviewed the licensee's air sample and analysis program, internal dose assessment program, employee training program, the TEDE/ALARA evaluation process and implementing procedures, and interviewed several employees to determine their level of knowledge of the policy and procedures. The program appeared sufficient to effectively implement the revised 10 CFR 20 changes.

Also reviewed was the licensee's passive internal monitoring study to determine whether or not gamma sensitive portal monitors and beta sensitive whole body friskers were effective in detecting small quantities of internally deposited radioactive material. Based on their study it appeared the gamma sensitive monitors detect internally deposited gamma emitters at about 1% of the Annual Limit Intake (ALI) with 95% reliability and the beta whole body friskers with greater than 90% reliability. Based on the inspectors review (no actual validation of the monitor performance using radioactive material was conducted) it appeared the licensee's use of both types of monitors provided a sound basis for implementation of the passive monitoring program.



5. Planning and Scheduling for the Upcoming Unit 2 Outage (IP 83750)

There have been no major changes in the overall station ALARA management program since the previous inspection. The ALARA coordinator continued to act as the overall coordinator of ALARA activities at the station. This individual also acted as the job planning interface with the work control group and the Radiation Work Permit (RWP) group reported to him. During the upcoming Unit 2 refueling outage (U2R94), a contractor ALARA worker was planning to assist him and another contract individual assigned to the Site Engineering and Construction staff in performing early ALARA reviews and dose monitoring of work performed by contract groups. This contractor helps coordinate job reviews, pre-job meetings, and exposure monitoring during the accomplishment of contract work. Station RP individuals indicated that a good working relationship existed between their staff and the contract group. No ALARA or RP individuals were assigned to the Mechanical Maintenance Department (MMD) to act as coordinator for MMD work.

The inspectors reviewed the licensee's planning and scheduling activities for work to be performed during U2R94. It appeared the program was in place to ensure that RP and the ALARA coordinator were sufficiently involved in the planning and scheduling process, aware of those jobs which can result in emergent work, and had time to implement ALARA initiatives. By procedure the ALARA committee was required to meet when a job is expected to exceed 7.5 person-rem (0.075 person-Sv). In addition, the licensee kept daily track of the four highest jobs to ensure management oversight. For U2R94 the ALARA subcommittee will convene for some jobs not required by procedure so that more attention is given to smaller dose jobs.

The inspectors reviewed lessons learned from refuel outage U1R94, ALARA reviews for U2R94, ALARA subcommittee meeting notes, and ALARA initiatives planned for the major jobs for U2R94. During the U1R94 outage, it was noted that a major contributor to the outage dose was caused when all four steam generators (S/Gs) were drained simultaneously for an extended time to accomplish sludge lancing on the secondary side. This evolution resulted in higher than expected personal exposures for persons who worked in the lower containment. For U2R94, as a lesson learned the ALARA group proposed to work only two S/Gs at a time and that S/G secondary side work would not start until the primary side work was completed. Also, because U1R94 was scheduled to accomplish a full scope outage in a reduced period (from about 90 days to 65 days) planning and scheduling problems were noted, and in some cases workers perceived they were more driven by schedule than during previous outages. The licensee plans to address lessons learned from these problems for U2R94 as well as problems associated with scheduling of scaffold installation and removal which impacted on station dose for U1R94.

Plans for source term reduction for U2R94 included a chemical cleanup of the reactor coolant system performed at shutdown using acidification of the coolant by lithium removal and boration followed by addition of hydrogen peroxide and control of reactor coolant temperature which should increase crud removal, and chemical decontamination on the Regenerative Heat Exchanger and the Resistance Temperature Detector (RTD) loops. These initiatives have been relatively effective in reducing personnel dose during previous outages. The licensee was currently evaluating the removal of the RTD cold leg loop piping, which if accomplished could save up to an estimated 40-50 person-rem (0.4-0.5 person-Sv) per outage.

The station had established an exposure estimate of about 400 person-rem (4 person-Sv) for 1994. The final U1R94 outage dose was about 260 person-rem (2.6 person-Sv) which exceeded the original estimate of about 200 person-rem (2 person-Sv). Contributing to the higher than expected dose was emergent work consisting of repairing conoseals on the reactor head, replacement of the reactor coolant pump, draining of S/Gs at the same time and for a prolonged period, scheduling problems associated with a shorter outage, and problems with scheduling of scaffolding installation and removal. The projected dose goal for U2R94 is about 190 person-rem (1.9 person-Sv) and with the exception of not performing S/G eddy current work and reactor head penetration inspections (which can lead to emergent work) the size and scope of this outage will be about the same as U1R94.

No violations or deviations were identified.

6. Plant Tour (Inspection Procedure 83750)

The inspectors and licensee RP management personnel toured the auxiliary, turbine, and radwaste buildings. Over all, housekeeping and material condition were good. However, the inspectors noted several areas which warrant improvement including poor radiological housekeeping in the instrument control workshop, adjacent storage areas and other work areas, improper use of bags designated (magenta colored) for storage and transport of radioactive material only, and evidence of cigarettes in the RCA. These examples were indicative of a lack of accountability and regard for radiological requirements by workers. In addition, there appeared to be insufficient guidance given to the RPTs providing auxiliary building zone coverage regarding "job ownership."

7. Exit Interview

The scope and findings of the inspection were reviewed with licensee representatives (Section 1) at the conclusion of the inspection on July 15, 1994. The licensee did not identify any documents as proprietary. The following specific items were discussed with the licensee during the exit meeting:

- Concerns regarding housekeeping in certain areas of the RCA (Section 6).
- ALARA planning and preparation for U2R94 (Section 5).