U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-245/89-03
50-336/89-04

Docket No. 50-245
50-336

License No. DPR-21
DPR-65

Category C

Licensee: Northeast Nuclear Energy Company
P. O. Box 270
Hartford, Connecticut 06101

Facility Name: Millstone Nuclear Generating Station

Inspection At: Waterford, Connecticut

Inspection Conducted: February 13-17, 1989

Inspectors: W. Thomas, Radiation Specialist FRPS, FRSSB — 3/15/89 date

Approved by: M. Shanbaky, Chief Facilities Radiation Protection Section, Facilities Radiological Safety and Safeguards Branch — 3/15/89 date

Inspection Summary: Inspection on February 13-17, 1989 (Report Nos. 50-245/89-03, 50-336/89-04.

Areas Inspected: Routine, unannounced inspection to review the radiation protection activities at Unit 1 and Unit 2. Areas reviewed included the Unit-2 refueling outage activities, Unit-1 refueling outage preparation activities, and station ALARA practices.

Results: No violations were identified. The radiation protection program was being properly implemented and preparations for the refueling outage at Unit 1 were proceeding adequately.

## DETAILS

### 1.0 Persons Contacted

#### 1.1 Licensee Personnel

*R. Doherty, MP-1 ALARA Coordinator
*H. Haynes, Station Service Superintendent
*M. Joyce, MP-2 Outage Assistant Radiation Protection Supervisor
*J. Keenan, MP-2 Superintendent
*B. Kreiling, Radiation Protection Specialist
*C. Palmer, Health Physics Supervisor - Support Services
*S. Scace, MP Station Superintendent
*G. Smith, MP-1 Assistant Radiation Protection Supervisor
*J. Sullivan, Health Physics Supervisor - Operations
*S. Torf, MP-2 ALARA Coordinator
*S. Turowski, Radioactive Materials Handling Supervisor

#### 1.2 NRC Personnel

*W. Raymond, Senior Resident Inspector
*M. Shanbaky, Chief, Facilities Radiation Protection Section, Region I
*W. Thomas, Radiation Specialist, Region I

*Attended the exit meeting on February 17, 1989

Other licensee personnel were also contacted during the course of this inspection.

### 2.0 Purpose

The purpose of this routine, unannounced inspection was to review the implementation of the radiation protection program during the Unit 2 refueling outage, and the preparation for the refueling outage at Unit 1. The following areas were included in this review:

-External Exposure Controls,
-Internal Exposure Controls,
-ALARA,
-Control of Radioactive Materials and Contamination
-Unit 1 Outage Planning and Preparation

### 3.0 External Exposure Control

By direct observation, discussions with licensee personnel, and review of personnel exposure records, it was determined that personnel dosimetry is used effectively and in accordance with 10 CFR 20.202 requirements for monitoring external exposure. The review of records included the review of whole body and skin dose measurements which are maintained by Dosimetry Services.

During this inspection the question was raised whether the present TLD badge in use by the licensee is capable of providing an accurate assessment of shallow dose since the open window is covered by a sheet of plastic. The licensee informed the inspector that the shallow dose is determined by the use of an algorithm obtained by exposure of badges with and without various absorbers in front of the badge and extrapolation back to zero absorption. The licensee also indicated that the present TLD badge will be changed in the near future. The inspector indicated that this matter will be reviewed during a subsequent inspection.

The personnel dosimetry program has received NVLAP accreditation in test categories I through VII. In addition all personnel are required to wear direct reading dosimeters, and either alarming dosimeters or teledosimeters are issued for work in high radiation areas such as in the steam generators. Direct Reading Dosimeter (DRD) results are compared to the TLD results at the end of each badging period. A current running total by DRD is issued daily and used as a management and administrative control for worker and job dose control. Control/action levels are set for each high radiation area job by the Radiation Protection Supervisor and operations management. All work within the Radiologically Controlled Area (RCA) is planned with operations management to assure that all work is performed in a manner to assure ALARA and within the established administrative limits. Current radiation area survey data and personnel DRD data are also used to ensure that personnel remain within administrative dose limits. The Radiation Work Permit (RWP) program assures that for each job performed in the RCA, personnel wear the proper protective clothing and are equipped with the proper dosimetric devices for external dose control.

All high radiation areas are equipped with key locks and are properly posted. Within containment, locked high radiation area gates are posted and visual surveillance of the gates is provided during the Unit 2 outage. Unit 1 re-racking of the spent fuel pool was accomplished earlier this year in anticipation of the Unit 1 outage. This work was accomplished without incident. The Unit 2 Plant Superintendent continues to be involved with and provides management oversight of ongoing radiation protection activities. Daily job progress reports and ALARA exposure progress reports are provided for management review and comment. During tours of the plant with HP technicians it was determined that the proper posting and labeling requirements were met.

## 4.0 Internal Exposure Control

During the previous calendar year the licensee had one incident that presented the potential for an intake exceeding 40 MPC-hr. The licensee has implemented proper corrective actions to prevent a recurrence of this incident. For initial containment entries to Unit 2, personnel are randomly whole body counted after entry to verify that no uptake has actually taken place.

For the present outage at Unit 2 a satellite respirator issue station has been set up in containment. The satellite issue station affords better control of respirators and assurance that they are returned after use. Technicians who man the issue stations are aware of the station requirements for the issuance of respirators. These requirements include verification of a mask fit, respirator training, and a current physical examination. The individual requesting a respirator must also be signed in on a valid RWP.

After use masks are sanitized, inspected, dated, and stored for future use. Adequate stocks of respiratory protective equipment are maintained at each unit on site. Backup supplies are also available from the site stores warehouse. The licensee also continues to use process and other engineering controls to limit concentrations of radioactive materials in air to levels below those which delimit an airborne radioactivity area. When respiratory protective equipment is used to limit the inhalation of airborne radioactive material, pursuant to paragraph (b)(2) of 10 CFR 20.103, the licensee uses equipment that is certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA).

The licensee maintains and implements a respiratory protection program that includes an air sampling program sufficient to identify airborne radioactivity hazards, affords proper equipment selection, and the ability to estimate possible exposures. Surveys and Bioassays are performed as appropriate to evaluate actual exposures. The licensee has implemented written procedures regarding selection, fitting, and maintenance of respirators. Testing of respirators for operability immediately prior to each use and sanitization of respirators after use is required. Written procedures regarding supervision and training of personnel and issuance records have been implemented. All respirator users are required to undergo a yearly physical examination by a physician, who shall certify that the individual user is physically able to use the respiratory protective equipment.

A written policy statement on respirator use has been issued covering use of engineering controls as practicable instead of respirators, routine, non-routine, and emergency use of respirators, and periods of respirator use and relief from respirator use. The Health Physics Control Point Monitors advise each respirator user that the user may leave the work area or location at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communication failure, significant deterioration of operating conditions in the work area, or any other condition that might require such relief.

The licensee continues to use equipment within limitations for type and mode of use and provides proper visual, communications, and other special capabilities such as adequate skin protection when required for steam generator work.

## 5.0 Maintaining Occupational Exposures ALARA

The ALARA program was discussed with several workers to determine whether they understood the ALARA program, understood their role in the program, and were actively involved in the program. Most of the workers who were interviewed were aware of the program, were actively involved in the program, and understood their role in the program. ALARA suggestions are actively solicited from all workers and acted upon if judged to be feasible in reducing dose accumulation by workers. ALARA low dose rate areas have been determined throughout the plant and workers have been instructed to use the ALARA areas as waiting areas during slack periods in work activities.

ALARA Goals based on exposure estimates for both the refueling outage at Unit 2 and the year as a whole have been set. During the outage, the status of the cumulative exposure is reviewed at each outage meeting. An outage goal of 560 man-rem based on an outage estimate of 591.5 man-rem has been adopted. Exposure as of February 13, 1989 was 128 man-rem or 23 percent of the exposure goal. Extensive engineering improvements to the steam generator nozzle dam installation resulted in a significant man-rem saving at the beginning of the outage. The total annual collective dose for the facility, although higher than similar facilities, has been decreasing. It is expected that replacement of the steam generators in 1992 will result in a further decrease in total annual collective dose for Unit 2.

## 6.0 Control of Radioactive Materials and Contaimination

During tours of Unit 1 and Unit 2 and during discussions with workers, aspects of surveys and monitoring were evaluated. It was determined that adequate surveys necessary to post and control radiation areas and high radiation areas are required and are performed. Friskers and PCM-1Bs are located at all exits from the RCA. Use of the PCM-1Bs is monitored by an HP Technician and hot particle surveys are performed daily in those areas where the likelihood of finding hot particles is highest. It was determined that the survey practices for personnel contamination and hot particles are adequate.

During the tour of the Unit 2 RCA at the exit from the auxiliary building, it was noted that delineation of the corridor to separate personnel exiting the RCA prior to use of the PCM-1B from other personnel using the corridor was not adequately controlled. The licensee, when informed of the inspector's concern that there was the possibility of mixing potentially contaminated and non-contaminated personnel, was immediately responsive and indicated that better delineation and separation of the traffic flow patterns in this area were in order and would be accomplished. The inspector indicated that this matter would be checked during the next inspection.

Records of surveys and survey results are reviewed by health physics management on a daily basis and distributed to the health physics staff at each radiation control point. Plant conditions and contamination status are also reviewed weekly at the outage planning and status meetings for use in work planning and dose control. It was noted during a tour of Unit-1 that a large area of the facility has been decontaminated and released from contaminated area controls. Extensive house keeping improvements have also been accomplished outside of the facility in the radwaste storage areas.

## 7.0 Unit 1 Outage Planning and Preparation

The Unit 1 refueling outage is scheduled to begin on April 1, 1989. In preparation for the outage, Unit 1 will hire 66 additional health physics technicians and has made arrangements to transfer senior technicians from Units 2 and 3. Needed health physics supplies and materials are on the routine order for all three units. PCM-1Bs have been ordered for all exits from the Unit 1 RCA, and will be in place prior to the start of the outage.

## 8.0 Exit Meeting

The inspector met with the licensee personnel listed in Section 1.0 of this report on February 17, 1989. At that time, the inspector summarized the purpose, scope and findings of this inspection.