U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No.	50-213/94-06
Docket No.	50-213
License No.	DPR-61
Licensee:	Connecticut Yankee Atomic Power Company Post Office Box 270 Hartford, Connecticut 06141-0270
Facility Name:	Haddam Neck Plant
Inspection At:	Haddam Neck, Connecticut
Inspection Conducted:	March 28 - April 1, 1994

Inspector: _____ 4/4/94
J. Furia, Senior Radiation Specialist, date

Approved by: _____ 4/05/94
R. Bores, Chief, Facilities Radiation Protection Section date

Areas Inspected: Qualifications review for the new Health Physics Manager, ALARA, radiation protection during normal operations, dosimetry records, radiation protection instrument calibration and training.

Results: Continued strong performance in the radiation protection program was noted. Health Physics control of work activities was generally very good, and ALARA goals were generally being met. A strong program for dosimetry records and for instrument calibration was also observed.

DETAILS

1. Personnel Contacted

1.1 Licensee Personnel

* R. Aft, ALARA Coordinator
* J. Beauchamp, Supervisor, Quality Assurance Services
D. Burns, General Employee Training
T. Burns, Health Physics/Chemistry Training Supervisor
W. Gates, Radiation Protection Supervisor
R. Groves, Instrumentation Calibration
R. Haight, Radioactive Materials Handling Supervisor
* J. Goergen, Radiological Engineering Supervisor
* I. Haas, Corporate Radiological Assessment
G. McElhone, Quality Assurance Services Auditor
R. McGrath, Senior Radiological Engineer
* W. Nevelos, Director, Connecticut Yankee Services
* P. Pritchard, Assistant Radiation Protection Supervisor
* J. Stetz, Vice President
* J. Sullivan, Health Physics Manager
* M. Sweeney, Radiation Protection Supervisor - Services
* A. Vomastek, Technical Trainer

1.2 NRC Personnel

P. Habighorst, Resident Inspector
W. Raymond, Senior Resident Inspector

* Denotes those present at the exit interview on March 31, 1994.

2. Radiation Protection Program

Since the last inspection in this area, the licensee promoted its Health Physics Manager to the position of Station Services Director, and in February 1994, filled the vacated Health Physics Manager's position. The individual selected to fill this position is required to meet certain minimum qualifications, in accordance with plant Technical Specification 6.3.1.1. These minimum qualifications include an academic degree in engineering or science and five years technical experience in the area of radiation safety, including three years in applied radiation work at a nuclear facility. The individual selected has both a bachelors and masters degree in science, and over 10 years of applied radiation work at a commercial nuclear power facility, and thus meets the Technical Specification requirements to serve as Health Physics Manager.

In addition to the new Health Physics Manager, the licensee also filled the vacant position of Radiological Engineering Supervisor, and added six additional technicians to its Health Physics staff.

2.1 Maintaining Occupational Exposure As Low As Reasonably Achievable

The licensee has continued to support a strong program for maintaining occupational exposures As Low As Reasonably Achievable (ALARA). In 1993, its 17th refueling outage (RF-17) was completed with one of the lowest exposure totals in the last 10 years (392 person-rem). The outage goal was 464.1 person-rem. This was accomplished through extensive use of pre-outage work planning, which aided in keeping the outage under 60 days in duration, and the continuing efforts by the ALARA staff to find ways to reduce exposure through the use of time-saving tools and equipment. During this outage, the licensee introduced a quick connect/disconnect scaffold, which led to significant dose savings, especially in work around the loop areas of the containment, where the highest outage dose rates were found.

In spite of the general success of the outage, In-Service Inspection, especially valve testing, was of some concern. Total person-hours used for this work were approximately three times higher than projected, due to a large number of valves failing the test criteria, and as a result needing rework/repair. A summary of work activities that were estimated to be greater than five person-rem are listed below.

Job/Activity	Estimate (Rem)	Actual (Rem)
Primary Steam Generator Work	125.00	107.95
Reactor Core Refueling	55.00	51.00
In-Service Inspection	48.26	54.47
Loop Drain Isolation Valves	6.00	5.10
Secondary Steam Generator Work	13.38	7.55
Appendix J Modifications	15.60	11.33
Reactor Coolant Pump #3 Seal	7.10	5.91
MOV's Live Loading	8.60	4.56
Steam Generator #4 Weld	7.16	4.28

In February 1994, the licensee commenced a six-week outage to perform service water system work. Although this work did not require the fuel to be off-loaded, the licensee took advantage of the time to complete certain maintenance activities in the containment, the most notable being the painting of the reactor cavity and the replacement of one of the reactor coolant pump seals. Many of the lessons learned during RF-17 were applied to this outage, with the result being that the outage was completed with a total exposure of 44.47 person-rem, while the outage exposure goal was 51.24 person-rem. Listed below are the exposures from the most dose significant work performed during the outage.

Job/Activity	Estimate (Rem)	Actual (Rem)
Cavity Painting	27.00	22.66
Reactor Coolant Pump #1 Seal	6.38	3.85
Operations Department Activities	6.00	5.23
Valve Repairs	2.00	0.78
Carfan Cooler Maintenance	2.20	1.67
Health Physics Coverage	2.00	2.14

For 1994, the licensee established a site exposure goal of not more than 117 person-rem. This included the service water outage, normal operations without any additional outage days, and one project to repair and clean-up the tank farm area.

2.2 Radiological Activities During Normal Operations

At the time of this inspection, the licensee was completing the service water outage discussed above, and on March 30th officially exited the outage and commenced normal operations again. Two significant changes have occurred since the last inspection in this area, the activation of a new computerized access and health physics data tracking system and the implementation of the revised Title 10, Code of Federal Regulations, Part 20 (10CFR20).

The licensee has installed and commenced operating the Personnel Radiation Exposure Management (PREM) system for access to the Radiologically Controlled Area (RCA). Through this system, exposure data can be tracked in a much more timely manner to support ALARA activities, and access to the plant can be controlled with much finer detail. Restrictions can be placed on various aspects of a given Radiation Work Permit (RWP) to limit access, such as total exposure allowed under the RWP, or the requirement that only respirator-qualified personnel can enter under an RWP. The

ALARA staff can search this data base on a regular basis to track and trend exposure data, and to revise exposure controls as necessary.

On January 1, 1994, the licensee implemented the revised 10CFR20. Significant changes on the licensee's part were required in the area of dosimetry records, as discussed in Section 2.3 below, and in the area of radiological postings. In the past, large areas of the Radiologically Controlled Area (RCA), especially the yard area on the east side of the plant, were posted as a Radiation Area, even though dose rates rarely exceeded 2-3 milliroentgen per hour (2-3 mR/hr). Upon implementation of the revised 10CFR20, the RCA, especially the yard area was reposted, and now only small discrete areas of the RCA having dose rates of 5 mR/hr or greater are posted as Radiation Areas.

The inspector conducted several tours of the RCA, and noted that the licensee had significantly reduced the areas requiring the use of protective clothing to reduce the spread of radioactive contamination. This effort will reduce the amount of laundry and Dry Active Wastes (DAW) generated at the facility. Only two minor discrepancies were noted during these tours, and each was immediately reviewed and corrected as appropriate by the licensee staff.

The inspector discussed with members of the Quality Assurance Services staff a recent audit of the Health Physics program. This audit was conducted during a five-day period in late March, 1994, using five auditors, including three technical specialists from the Millstone Power Station and one from the Yankee Atomic Power Company. Although the audit report will not be issued for several weeks, the lead auditor indicated that no items of safety significance were identified during the audit. The inspector will review this audit report during the next inspection of this area.

2.3 Radiation Protection Support Services

As part of this inspection, a review of the dosimetry records and radiological instrument calibration program was conducted. Both of these program areas are under the direction of the Radiation Protection Support Services Supervisor, who reported directly to the Health Physics Manager.

Dosimetry record keeping was significantly changed with the revised 10CFR20 regulations. As part of this inspection, active records of current licensee employees and licensee contractors were reviewed for completeness and accuracy. Files were maintained in the dosimetry office located just outside the main RCA access point. In addition to hard copies, the licensee also maintained dosimetry records in the PREM system data base. Records maintained included completed NRC Form 4s and Form 5s, respirator fit test records and whole body count and urinalysis results. No record discrepancies were noted. The licensee utilizes thermoluminescent dosimeters for determining dose of record, and these dosimeters are processed on a quarterly basis

by the licensee's corporate dosimetry laboratory. This laboratory will be inspected during a subsequent inspection of this area.

The licensee calibrates all of its radiological survey instruments on site at its calibration facility. The principal source used for calibration is a JL Sheppard box irradiator utilizing two cesium-137 sources. Instruments are generally calibrated on a semi-annual basis. The irradiator is verified on an annual basis using a Victoreen Condenser R-Meter, which is in turn calibrated annually at Victoreen using a national Institute of Standards and Technology (NIST) secondary source. Alpha detection survey instruments are calibrated using a plutonium-239 standard, while neutron survey instruments are calibrated using an americium-241/beryllium source stored in the Waste Disposal Building. Sources located in the Waste Disposal Building are also utilized for the calibration of pocket ion-chambers, which are also calibrated on a semi-annual basis.

2.4 Training

The licensee's training program for health physics technicians continued to be a notable licensee strength. During the latter part of 1992 and continuing into 1993, the Training Department conducted a series of three training sessions: (1) an introduction to new 10CFR20 concepts and terms; (2) the theory behind the 10CFR20 revisions; and, (3) the new limits, licensee procedures and scenario-based training. In addition to these training sessions, the licensee also conducted Significant Notice Training (SIGNOT) on reactor coolant pump seal rebuilding and air sampling for the revised 10CFR20. Additional multidisiplinary training was also presented in the areas of basic valves and pumps and response to medical emergencies. In these training sessions, the licensee utilized a scenario based training concept, involving not only the health physics technicians but also other personnel involved.

Training for all plant workers on the revised 10CFR20 was given by the General Employee Training (GET) group during September - December, 1993. This training was in addition to the annual Radiation Worker Training. Key concepts related to the revised 10CFR20, together with an understanding of how these changes will impact on the average worker, were discussed.

3. Exit Interview

The inspector met with the licensee representatives denoted in Section 1 at the conclusion of the inspection on March 31, 1994. The inspector summarized the purpose, scope and findings of the inspection. The licensee acknowledged the inspection findings.