U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-443/90-18

Docket No. 50-443

License No. NPF-56

Licensee: Public Service Company of New Hampshire
P.O. Box 330
Manchester, New Hampshire 03105

Facility Name: Seabrook

Inspection At: Seabrook, New Hampshire

Inspection Conducted: August 20-24, 1990

Inspector: RL Nimitz — 9/6/90
R. L. Nimitz, Senior Radiation Specialist — Date

Approved by: W. J. Pasciak — 9/6/90
W. J. Pasciak, Chief — Date
Facilities Radiation Protection Section

Inspection Summary: NRC Inspection Report No. 50-443/90-18 (Conducted August 20-24, 1990) This inspection was a routine, unannounced inspection of the licensee's radiological controls program. Areas reviewed were: the licensee's actions on previous inspection findings, audits, external and internal exposure controls, radioactive and contaminated material control, contamination controls, and calibration of radiation monitoring equipment.

Results: One violation involving failure to maintain an access point to a High Radiation Area locked was identified (Details Section 9.0). The inspector identified a need to improve the identification of the station's radiological controlled area boundary. One unresolved item involving acceptability of testing of alarm/trip set points for radiation monitors was identified (Details Section 8.0).

DETAILS

1.0 Individuals Contacted

1.1 Public Service of New Hampshire

*D. Moody, Station Manager
W. DiProfio, Assistant Station Manager
*W. Leland, Chemistry, Health Physics Manager
*J. Rafalowski, Health Physic Department Supervisor
R. Litman, Chemistry Supervisor
S. Dodge, Health Physics Supervisor - Support
*W. Cash, Health Physics Supervisor - Operation
E. Darois, Health Physics Supervisor - Dosimetry
R. Belanger, Lead Engineer - Compliance

1.2 NRC

*Noel Dudley, Senior Resident Inspector, Seabrook Station

*Denotes those individuals attending the exit meeting on August 24, 1990.

The inspector also contacted other licensee personnel.

2.0 Purpose and Scope

This inspection was a routine, unannounced radiological controls inspection.

The following matters were reviewed:

- action on previous inspection findings
- audits, surveillances and self-assessments
- radioactive and contaminated material control
- contamination controls
- external exposure controls
- internal exposure controls
- calibration of radiation monitoring instrumentation
- implementation of the radiological occurrence program.

3.0 Action on Previous Finding

(Closed) Follow Item (50-443/86-39-05) NRC to review the licensee's derivation and use of neutron dosimetry calibration factors. The inspector's review indicated that the licensee purchased and used both a tissue equivalent proportion counter (TEPC) and a helium-3 neutron spectrometer to develop correction factors for the neutron dosimetry worn during entries into containment at power.

The initial factors utilized to correct the initial dosimetry results were obtained from another utility. The factors compared favorably to those obtained using the measuring instruments. The measuring instruments used (TEPC and helium-3 spectrometer) were calibrated at the National Institute of Standards and Technology (NIST). The licensee controlled neutron exposure of personnel during the measurements at power in containment by use of portable instrumentation (rem balls) and stay times. This was consistent with guidance specified in Regulatory Guide 8.14, Personnel Neutron Monitoring. The licensee is currently finalizing the report of the measurements. The results will be reviewed during a routine inspection.

4.0 Audits, Surveillances and Self-Assessments

The inspector reviewed audits, surveillances, and self-assessments of the radiological controls program. The inspector also reviewed audits of the radiation protection program performed by outside groups (e.g., INPO).

The review was with respect to criteria contained in Technical Specifications, and applicable licensee procedures.

The evaluation of the licensee's performance in this area was based on discussions with cognizant personnel and review of documentation.

Within the scope of this review, no violations were identified. Audits were considered to be of good quality and performance based. The following was noted:

- The licensee has a well defined radiation protection surveillance program. The program was implemented, appropriately qualified personnel were performing the surveillances and observations, and findings were addressed in a timely manner. Personnel performing surveillances received training in performance based audit techniques.

- The licensee performed audits of the radiation protection program using appropriate audit plans. Technical specialists were utilized where appropriate to review program areas. Corrective action was taken for observations and findings.

- The licensee implemented the Phase 2 self-assessment of power ascension by an independent review team (IRT). The team utilized appropriately qualified independent technical experts in the area of radiation protection. The IRT reviewed facility operation from December 1989 through the 50 percent reactor power plateau. The IRT reviewed eight principle areas which included program implementation, communications, teamwork, training, and the corrective action process.

5.0 Radioactive and Contaminated Material Control and Contamination Controls

The inspector reviewed radioactive and contaminated material controls and contamination controls. The review was with respect to 10 CFR 20, Standards for Protection against Radiation, applicable Technical Specifications, and applicable licensee procedures.

The following matters were reviewed:

- provision and use of portal monitors and friskers for purposes of personnel contamination monitoring
- adequacy and implementation of routine surveys for contamination and contamination control work techniques
- radioactive and contaminated material posting
- contamination surveys for material removed from the radiological controlled area.

The evaluation of the licensee's performance in this area was based on review of documentation, discussions with cognizant personnel, and independent observations made by the inspector during tours of the facility.

Within the scope of this inspection, no violations were identified. The following matters were discussed with the licensee's representatives.

- Posting of radiological controlled areas needs improvement. The following observations were made:
  - Posting of exterior doors of the radiological controlled area (RCA) was inconsistent.
  - Several signs were found on the floor. A Radioactive Material Area sign was found on the floor in the machine shop. An individual could enter the RCA through the door without realizing that they were in a radiologically controlled area. The sign was immediately re-posted.
- Doors are periodically opened that lead from the radiological controlled areas to non-radiological controlled areas. Although the doors were clearly posted that no personnel egress was permitted, the posting did not prohibit personnel from passing material, that was not frisked for contamination, out of the doors.

The licensee's representatives indicated the above matters would be reviewed.

- The licensee evaluated about 1000 personnel contamination events (July 1989 through July 1990). The majority of the events involved low level contamination with radon daughters. There were only three instances of personnel contamination attributable to causes other than radon contamination. These three events were properly evaluated.

6.0 External Exposure Controls

The inspector reviewed external exposure controls. The review was with respect to criteria contained in 10 CFR 20, Standards for Protection against Radiation, applicable Technical Specifications, and applicable licensee procedures.

The following matters were reviewed:

- issuance and use of personnel dosimetry
- establishment and use of personnel exposure limits
- dosimetry records including NRC Form 4 and Form 5's
- issuance and use of radiation work permits and associated surveys
- adequacy and performance of radiation surveys necessary to post and control high radiation and radiation areas and review of survey results by supervision
- adequacy of supply, maintenance and calibration and performance checks of survey and monitoring instruments
- adequacy and implementation of surveys necessary to assess personnel exposure due to skin contamination including hot particle contamination
- dissemination of survey data
- review and evaluation of discrepancies between pocket dosimeter dose results and dosimetry discrepancies
- adequacy and implementation of posting requirements
- access control to High Radiation Areas
- results of shield surveys
- use of dosimetry accredited in accordance with the National Voluntary Laboratory Accreditation Program (NVLAP) testing Categories I through VIII
- implementation of guidance for personnel neutron monitoring contained in Regulatory Guide 8.14, Personnel Neutron Monitors.

The evaluation of the licensee's performance in this area was based on review of documentation, discussions with cognizant personnel and independent observations made by the inspector during tours of the facility. The inspector also performed independent radiation measurements during tours of the facility, including measurements of ambient radiation levels external to station buildings using micro-R meters.

Within the scope of the review, no violations were identified. The external exposure control program was properly implemented. Records were complete, maintained, and retrievable.

The following matters were discussed with the licensee's representatives:

- Routine radiation work permit (RWP) No. 90 R 123 was established to provide radiological controls for routine operations activities including draining and venting. The permit indicated that air samples should be collected while breaching a highly contaminated system. It was not clear what is a "highly contaminated" system.

- Routine RWP No. 90 R 124 was established to provide radiological controls for chemistry personnel during routine sampling operations. The permit did not require chemistry personnel to make radiation surveys of samples prior to handling them. Also no guidance regarding criteria for use of extremity dosimetry was contained in the RWP.

- The licensee does not require performance/calibration checks of radiation survey meters prior to each use. Such checks are recommended by applicable industry standards.

- There were no procedures in-place that provided guidance for determining personnel exposure from hot particles.

- The licensee evaluated 300 dosimetry discrepancies/anomalies in the period January 1990 through August 1990. The majority of these involved dropped dosimeters or dosimeters whose reading had drifted, giving an unexpected reading. Each evaluation provided an acceptable basis for assigning a dose. The discrepancies/anomalies were reviewed and approved by a supervisor. However, the evaluation process did not include a review process to identify individuals with multiple dosimetry problems. Such an evaluation would identify and provide for identification of the need to retrain personnel on proper dosimetry use or identify potential tampering with dosimetry.

- Inspector review found that the job descriptions of selected radiation work permits were broad. Such job descriptions would allow for performance of work that is not necessarily bounded by the radiological controls prescribed on the RWP for the work activity.

- The external exposure control program did not identify what radiological surveys should be included with active radiation work permits. Such surveys would be used for purposes of briefing workers, providing information for shift turnover for radiation protection personnel covering RWPs, and monitoring the trend of radiological conditions of a particular work area. The inspector needed to search through a records storage system to obtain current surveys for on-going work. This took some time even though only a few RWPs were in effect. The inspector noted that such a process would be cumbersome when a significant number of active RWPs were in effect.

The licensee's representatives indicated the above matters would be reviewed.

7.0 Internal Exposure Control

The inspector reviewed the internal exposure control program. The review was with respect to criteria contained in 10 CFR 20, Standards for Protection against Radiation, applicable Technical Specifications, and applicable licensee procedures.

The following matters were reviewed:

- performance, adequacy and documentation of airborne radioactivity surveys to support radiation work permits and the routine surveillance program
- implementation of the bioassay program
- bioassay analysis results of all personnel since initial reactor criticality
- bioassay criteria for performance of bioassays and equipment sensitivity
- air sample equipment calibration.

The evaluation of the licensee's performance in this area was based on review of documentation, discussions with cognizant personnel, and independent observations made by the inspector during tours of the facility.

Within the scope of this review, no violations were identified. The internal exposure control program was properly implemented. Records were complete, maintained, and retrievable.

The following matters were discussed with the licensee's representatives:

- The airborne radioactivity survey program does not discuss disposition of airborne radioactivity sample analysis results once the results are sent to the health physics control point.

- Airborne radioactivity sample analysis results do not contain sufficient information to allow reconstruction of the calculation used to calculate airborne radioactivity concentrations.

The licensee's representatives indicated the above matters would be reviewed.

8.0 Instrument Surveillance

The inspector reviewed the surveillance testing of selected radiation monitoring systems identified in Technical Specifications. Data for the following monitors was reviewed:

- containment post LOCA monitors
- reactor coolant system leakage detection monitors
- main steamline monitors
- control room air intake monitors
- primary component cooling monitors
- containment vent isolation
- fuel storage pool radioactivity monitors.

The evaluation of the licensee's performance in this area was based on review of documentation, discussions with cognizant personnel, and independent observations made by the inspector during tours of the facility.

Within the scope of this review no violations were identified [illegible] for the monitoring system surveillances were maint[illegible]ined and [illegible] The following matters were discussed with the licensee's re[illegible]

- There was no definition of what constitutes a Digital Ch[illegible] Operational Test (DCOTs) in section 1 of the technical specifications. Such definitions are normally placed in sec[illegible] Inspector review of the DCOTs for the above monitors indicated the licensee was using a definition of DCOT contained in the footnotes of Table 4.3-6 of the Technical Specifications. The definition indicates that the test demonstrates alarm annunciation when the instrument indicates measured levels above the alarm/trip set point. The alarm/trip set point is a specified value for several of the above listed monitors.

  The inspector noted that the licensee lowers the alarm/trip set point below that specified in the technical specifications until an alarm actuation occurs when the alarm/trip set point is reduced below the normal background of the instrument. The inspector noted that this did not appear to meet the definition used by the licensee in that the actual alarm/trip set point was not tested but rather alarm actuation was tested at a lower set point. Also, at what lower value the alarm actually annunciated was not documented. The actual alarm set point was tested during the calibration of the instruments (normally once per refueling). The inspector indicated that surveillance testing of radiation monitors relative to performance of the DCOTs was an unresolved item. (50-443/90-18-01)

- The licensee maintains a digital alarm/trip set point data base for radiation monitoring instrumentation. It was not clear if the licensee periodically checked the alarm/trip set points against the data base other than during routine instrument calibrations which are performed about every 18 months. The licensee's representatives indicated this matter would be reviewed.

9.0 Radiological Occurrence Reviews

The inspector reviewed the implementation of the radiological occurrence report program. This is a program whereby the licensee documents and provides a mechanism to track radiological occurrences. Typically the occurrences are identified by the licensee.

The inspector's review identified three examples of failure to maintain access points to High Radiation Areas locked. The inspector reviewed these examples relative to the criteria for non-issuance of a Notice of Violation identified in 10 CFR 2, Appendix C, Section V. G., Exercise of Discretion.

Event 1.

On April 19, 1990, at 5:18 p.m. it was discovered by a radiation protection technician that the containment personnel access hatch door was not secured with the radiation protection lock designed to control access to the containment.

The lock had been locked by a radiation protection technician on April 18, 1990, at about 6:00 p.m.. However, the lock did not properly close the hasp which secures a door control panel. The door had been unlocked for about one day. However, the breaker that provides power to the door controls was tagged out and no entries to the containment had been made during the period. The containment exhibited areas with radiation levels above 1 rem/hr. The access points to such areas are to be locked in accordance with technical specification requirements.

The inspector noted that this matter was identified by the licensee, that the matter was reported to the NRC, that the matter was not a Severity Level III problem, and that the licensee took the following corrective actions for the matter:

- A radiological occurrence report (90-11) was issued upon discovery of the unlocked door.
- A Licensee Event Report was issued on May 21, 1990.
- The technician who improperly secured the door was counseled.
- A meeting was held with all appropriate radiation protection technicians to discuss the matter.
- A sign was placed at the locking mechanism to provide instructions to personnel locking the door.
- Technicians unfamiliar with the containment access hatch door locking mechanism were provided individual instructions on the operation of the mechanism.
- A memorandum was sent to all appropriate technicians regarding the event and the need to check door locks as a standard operating procedure.

The inspector noted that a similar occurrence was identified on February 28, 1990, when it was discovered by radiation protection personnel that a radiation protection technician had left the door to the calibration facility open. The area was not a High Radiation Area at the time due to the calibration sources being in shielded storage locations. However, the door was to be controlled as normally locked. The radiation protection technician who left the door unsecured apparently failed to check the door to ensure that it had closed tightly upon his exit from the area.

The licensee issued a radiological occurrence report for this event and all appropriate radiation protection personnel were instructed on the need to ensure that locked High Radiation Area doors are secured prior to leaving the area. A memorandum detailing the need to make sure that doors shut and the door has locked and is secure prior to leaving the area was issued to all radiation protection personnel on March 1, 1990.

Event 2

On August 1, 1990, at 7:30 a.m. the licensee's radiation protection department head identified that the north door to the Demineralizer Alley (7 'Primary Auxiliary Building) was ajar and would permit access to the demineralizer area. The door would permit access to areas greater than 1 rem/hr. The door was alarmed and would provide indication of intrusion if it was opened.

The licensee's review indicated that the door was opened on July 31, 1990, at 9:48 a.m. by a radiation protection technician performing routine surveillances in the area. Upon leaving the area, the radiation protection technician did not adequately verify that the door had properly closed behind him and was locked. The door was checked by a second radiation protection technician on July 31, 1990, at 5:00 p.m. during a routine High Radiation Area door check. The radiation protection technician's door check was inadequate and did not identify that the door was open. No personnel entered the area during the period that the door was ajar and no unplanned exposures occurred.

The inspector noted the following:

- The licensee initiated a radiological occurrence report (90-20)
- The licensee re-adjusted the door alarm to ensure that the door would cause an alarm if left ajar.
- The licensee checked other doors and found them to be satisfactory.
- The licensee counseled the involved radiation protection technicians.
- The licensee held a meeting with all appropriate radiation protection technicians on August 3, 1990, to discuss the event.

The inspector noted that Technical Specification 6.11.2 requires that areas accessible to personnel with radiation levels greater than 1000 mR/hr at 18 inches shall be provided with locked doors to prevent unauthorized entries. The inspector noted that the north door to the Demineralizer Alley (7' elevation Primary Auxiliary Building) was not locked during the period July 31, 1990, (9:48 a.m.) through August 1, 1990, (7:30 a.m.) and would provide access to areas with radiation levels of 1,500 mR/hr at 18 inches. This was identified as a licensee identified violation of Technical Specification 6.11.2.

The inspector noted that the matter was identified by the licensee, the matter was reported, the matter was not a Severity Level III problem, and the licensee took corrective actions when the unlocked door to the Demineralizer Alley was identified. As such, this matter would normally be considered as a licensee identified non-cited violation.

However, it was not appropriate to consider this matter as meeting all criteria for issuance of a non-cited licensee identified violation in that the failure to ensure High Radiation Area access doors were properly locked was a recurrent matter as discussed above. In addition, each instance involved radiation protection personnel indicating ineffective corrective actions. As a result, the failure to lock the north door to the Demineralizer Alley (7' Primary Auxiliary Building) is a violation of Technical Specification 6.11.2 (50-443/90-18-02).

10.0 Exit Meeting

The inspector met with the licensee's representatives identified in Section 1 of the report on August 24, 1990. The inspector summarized the purpose, scope and findings of the inspection.