

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 85-16

Docket No. 50-29

License No. DPR-3 Priority -- Category C

Licensee: Yankee Atomic Electric Company

1671 Worcester Road

Framingham, MA 01701

Facility Name: Yankee Nuclear Power Station

Inspection At: Rowe, Massachusetts

Inspection Conducted: August 12-16, 1985

Inspectors: Jan A. Croffi for 9/25/85
Thomas Dragoun, Radiation Specialist date

Jan A. Croffi for 9/25/85
John McFadden, Radiation Specialist date

Approved by: M. Shanbaky 9/25/85
Mohamed Shanbaky, Chief date
PWR Radiation Protection Section

Inspection Summary: Inspection on August 12-16, 1985 (Report No. 50-29/85-16)

Areas Inspected: Routine, unannounced inspection of the licensee's radiation protection program including: status of previously identified items; respiratory protection; spent resin shipment; ALARA; posting and control of radiation areas; and the radiation protection procedures upgrade project. This inspection involved 76 inspector-hours onsite by two region-based inspectors.

Results: No items of non-compliance were identified.

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DETAILS

1.0 Persons Contacted

During the course of this routine inspection the following personnel were contacted or interviewed:

1.1 Licensee Personnel

N. N. St. Laurent,	Plant Superintendent
T. K. Henderson,	Technical Director
B. L. Drawbridge,	Assistant Plant Superintendent
G. M. Babineau,	Radiation Protection Manager
J. Kay,	Technical Services Manager
E. Chatfield,	Training Manager
S. Litchfield,	Health and Safety Supervisor
L. Bozek,	Quality Control Supervisor
P. Hollenbeck,	Radiation Protection Engineer
T. E. Long,	QA Engineer
T. Shippee,	Radiation Protection Engineer
M. T. Vandale,	Radiation Protection Engineer

1.2 NRC Personnel

J. W. Clifford,	NRR - Project Manager
H. Eichenholz,	Senior Resident Inspector

All personnel listed above attended the exit interview on August 16, 1985.

2.0 Purpose

The purpose of this routine inspection was to review the licensee's radiation protection program with respect to the following elements:

- Status of Previously Identified Items
- Respiratory Protection
- Spent Resin Shipment
- ALARA
- Posting and Control of Radiation Area
- Radiation Protection Procedures Upgrade Project

3.0 Status of Previously Identified Items

- 3.1 (Closed) Follow-up Item (83-11-02) Licensee to upgrade procedures so as to ensure adequate protection against IDLH atmospheres in restricted spaces. The licensee's Safety Manual describes controls on enclosed spaces. Additional action is described in a memorandum by the Safety Supervisor dated August 16, 1985.
- 3.2 (Closed) Unresolved Item (84-05-03) Review medical records under 10 CFR 20.103(c)(2). The licensee requires a physician signature indicating approval for respirator use by a worker.
- 3.3 (Closed) Follow-up Item (84-15-01) Upgrade ALARA program prior to next outage. All engineering design changes are reviewed by corporate HP's to identify high exposure jobs for ALARA review.
- 3.4 (Closed) Follow-up Item (84-22-03) Provide for QA/QC of rad materials shipments as required by 10 CFR 71.101 and 10 CFR 20.311. These requirements are now met. Licensee action is discussed further in section 5.0.
- 3.5 (Closed) Follow-up Item (85-02-01) Review revision to AP8422, respirator fitting that incorporates instructions on three-way valve. The fit booth sampling hoses have been redesigned to eliminate the three way valve. Procedure AP8522 was revised and re-issued August 1985.

4.0 Respiratory Protection

The adequacy of the licensee's respiratory protection program was reviewed against criteria contained in:

- 10 CFR 20.103 Exposure of individuals to concentrations of radioactive materials in air in restricted areas.
- Regulatory Guide 8.9, "Acceptable Concepts, Models, Equations, and Assumptions for a Bioassay Program"
- Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection"
- Regulatory Guide 8.20, "Applications of Bioassay for I-125 and I-131"
- Regulatory Guide 8.26, "Applications of Bioassay for Fission and Activation Products"
- ANSI N13.1, "Sampling Airborne Radioactive Materials in Nuclear Facilities"

- Procedure DP-8007, "Calculation of Internal Dose for a Single uptake of Soluble Radionuclides"
- Procedure DP-8008, "Dose Estimate to GI Tract and/or Lungs for a Single Uptake of Insoluble Radionuclides by Comparison with MPC's"
- Procedure AP-8012, "Respiratory Protection Training"
- Procedure DP-8015, "MPC Hour Accountability"
- Procedure DP-8030, "Evaluation of In-vivo Bioassay Results"
- Procedure DP-8105, "Breathing Zone Air Samples"
- Procedure OP-8401, "Respirator Selection and Use"
- Procedure OP-8405, "Bioassay Program"
- Procedure DP-8406, "Urine Bioassay Program"
- Procedure DP-8419, "Cleaning, Disinfection, Decontamination and Storage of Respirators"
- Procedure DP-8421, "Respiratory Protection Equipment Inspection and Maintenance"
- Procedure AP-8422, "Respirator Fitting"
- Procedure DP-8434, "Body Counting"
- Procedure DP-8565, "Calibration of the APOGEE Based In-vivo Bioassay System."

The licensee's performance relative to these criteria was determined by interviewing selected personnel, examination of records and direct observation of activities.

Within the scope of this review, no violations were identified. Strengths and weaknesses of the licensee's program are discussed as follows:

4.1 Organization and Management Controls

The responsibility for the respiratory protection program is assigned to one of the Radiation Protection Engineers. Trained and qualified RP technicians perform fit testing, whole body counting, mask issuance and mask cleaning. Only qualified RP Engineers are allowed to repair respirators, order repair parts, and recharge high pressure air supply bottles.

PORC-approved procedures are available for most aspects of the program. Certain procedures were recently revised while the remainder are currently under review. The licensee's policies are also stated in the site Radiation Protection Manual, however a Respiratory Protection Manual is mentioned but was not generally available.

The level of staffing, assignment of responsibility and availability of procedures appeared to be adequate considering the level of usage of respiratory protection equipment at the facility.

4.2 Qualification of Respirator Users

All radiation workers receive classroom instruction at the training center regarding respiratory protection during the slide-tape General Employee Training. Respirator users are fit tested using a corn oil aerosol with additional training provided by the RP technician conducting the test. Retraining is required biennially.

Site workers are examined annually by a physician. Contract workers must provide evidence that a physician has provided an examination. Medical Screening of all respirator users is repeated annually. Respirator users also receive a semi-annual whole body count to detect uptakes of radioactive material.

Completion of the various requirements prior to issuance of a respirator is tracked by the RP Engineering Assistant. Completion dates are entered manually onto a file card and checked. The workers name is then placed on a computer list which is provided to the respirator issue point. The inspector noted that some requirements must be updated semiannually while others were repeated biennially or annually. This lack of consistency and the manual tracking system does not ensure that a worker will receive the required updates. The licensee stated that the frequencies involved in respirator users requalification and the manual tracking method will be reviewed. The inspector stated that this matter will be reviewed in a future inspection. (85-16-01)

The inspector also noted that neither the training provided by the training department or the RP department adequately emphasized the information required by 10 CFR 20.103(c)(3). The licensee stated that the training will be improved prior to the October 1985 Outage. This matter will be reviewed in a future inspection. (85-16-02)

4.3 Respiratory Protection Equipment

All respiratory protection equipment and repair parts are ordered from the NIOSH approved list by the RP Engineer in charge. The RP Engineer repairs the respirators using the manufacturers recommen-

dations. Masks are stored in individual shelf slots to avoid deformations. The supply of respirators and repair parts appear adequate.

The licensee indicated that a new system will be installed during the next outage to provide breathing quality air to a manifold at the Vapor Container personnel airlock. This will replace the bank of high pressure air bottles currently used and increase the capacity of the available breathing air. The inspector noted that this change is a positive development.

4.4 Records and Reports

The licensee routinely conducts airborne radioactivity surveys of the general work area and the workers breathing zone. The highest airborne concentration measured is then used to calculate MPC-hours. These MPC-hours are recorded without reduction for respirator protection factors although respirators are normally in use. Credit for respirators is included in the calculation only if greater than 40 MPC-hours is accumulated in any seven consecutive days. The inspector noted that the licensee's method of calculating MPC-hours was not evident in the procedures. The licensee stated that this matter would be corrected as part of the overall program to upgrade procedures. The licensee stated that no worker had an actual uptake in excess of 40 MPC-hours in any week during the past few years.

Whole body counts (WBC) are performed on workers upon arrival on site, upon termination from site, and at six month intervals. WBC results are recorded and reported to workers as required.

5.0 Spent Resin Shipment

The licensee's preparation, packaging, and shipment of spent reactor system ion exchange resin was reviewed against criteria contained in:

10 CFR 61.55 Waste classification.

10 CFR 61.56 Waste characteristics.

10 CFR 20.311 Transfer for disposal and manifests

10 CFR Part 71 - Packaging and Transportation of Radioactive Material.

IE Circular 78-03 "Packaging Greater Than Type A Quantities of Low Specific Activity Radioactive Material for Transport" May 12, 1978.

IE Information Notice 83-10, "Clarification of Several Aspects Relating to Use of NRC-Certified Transport Packages" March 11, 1983.

IE Information Notice 84-72, "Clarification of Conditions for Waste Shipments Subject to Hydrogen Gas Generation".

Reg. Guide 7.1 Administrative Guide for Packaging and Transporting Radioactive Material.

Reg. Guide 7.7 Administrative Guide for Verifying Compliance With Packaging Requirements for Shipments of Radioactive Materials.

Reg. Guide 7.10 Establishing Quality Assurance Programs for Packaging Used in the Transport of Radioactive Material.

Certificate of Compliance 6601, Revision 20.

OP-8303 "Preparation of Spent Ion Exchange Resin for Shipment."

Chem-Nuclear Systems, Inc. Procedure FO-OP-023, "Bead Dewatering Procedure for CNSI 14-195 or Smaller Liners."

CNSI Procedure IR-OP-003, "Handling Procedure for CNSI Transport Cask CNS 8-120"

CNSI Procedure FO-AD-002, "Operating Guidelines for Use of Polyethylene High Integrity Containers."

The licensee's performance relative to these criteria was determined by direct observation of work, interviewing selected personnel and reviewing documentation.

Within the scope of this review, no violations were identified. Licensee strengths were noted by the following:

Spent resin shipments from this facility are an infrequent evolution occurring once every few years. The inspector noted that the licensee provided advance planning and coordination, conducted specialized training of personnel, and performed all work by procedure with hold point sign-offs and QC verification. Good management control was indicated for this process.

The licensee has established and is providing staffing for a new Quality Control department. This department will consist of a supervisor and several inspectors who will provide independent review of operations such as radwaste. The inspector noted that the upgrading of the QC program is a commendable effort.

6.0 ALARA

The changes in the licensee's ALARA program were reviewed by interviews with supervisors and a review of documentation. Within the scope of this review it was determined that the following positive developments had occurred:

- A corporate goal of 300 Man-Rem for 1985 total exposure has been established. This represents a reduction of about 10% from the previous year.
- All major dose commitment work for the October 1985 outage has been identified and is receiving an ALARA review.
- An ALARA suggestion box has been installed to solicit worker input.
- Prefabricated containment tents for the control of airborne activity have been purchased.

The following changes are considered to negatively impact the licensee's ALARA program:

- The ALARA Committee consisting of representatives from various departments has been disbanded.
- The position of ALARA Coordinator remains vacant.

Within the scope of this review no violations were identified.

7.0 Posting and Control of Radiation Areas

The licensee program for posting and control of radiation areas was reviewed against criteria contained in:

10 CFR 20.105 Permissible levels of radiation in unrestricted areas.

10 CFR 20.201 Surveys.

10 CFR 20.203 Caution signs, labels, signals and controls.

20 CFR 20.207 Storage and control of licensed materials in unrestricted areas.

Procedure OP-8100 "Establishing and Posting Controlled Areas"

The licensee performance relative to these criteria was determined by a tour of plant areas and independent measurement of radiation levels.

Within the scope of this review no violations were identified.

8.0 Radiation Protection Procedures Upgrade Project

In the Systematic Assessment of Licensee Performance (SALP) forwarded to the licensee on May 31, 1985 the NRC identified a programmatic weakness in regards the site radiation protection procedures. During the course of this inspection, the inspector met with licensee management to discuss

the licensee's action plan to address the NRC concerns. The licensee stated that corrective action began in May 1985. Major elements of the RP procedures upgrade project are:

- Several experienced professional HP have been transferred to the site from the corporate headquarters to provide assistance. Yankee plant experiences, INPO recommendations and NRC guidance will be utilized in the review process.
- All site RP procedures will be reviewed by following a prioritized list. New procedures may be created and others deleted depending on need.
- The review will be thorough. Comments from RP technicians and supervisors will serve as the basis for revisions. Revised procedures will be field tested and submitted for approval to PORC.
- Management considers this effort to be a long term project. A review of progress will be made on or about January 1986.

The inspectors were impressed by the management commitment and allocation of resources to this project. Status of this project will be reviewed in a future inspection (85-16-03).

9.0 Independent Performance Test

During inspection 85-09 in May 1985 the inspector arranged to have about 50 of the licensees' personnel dosimeters sent by the "E Lab" to Idaho National Engineering Laboratory for a test of the licensee's performance. The inspector stated that participation in the performance test was voluntary but would be of benefit to the licensee to evaluate the dosimetry program. The licensee stated that participation would be decided after discussion with the staff.

On August 26, 1985 the licensee informed the inspector that participation in the performance test during 1985 would be difficult due to heavy workload (outage) but future participation was anticipated. The inspector stated that arrangements will be made during a future inspection.

10.0 Exit Interview

The inspector met with licensee personnel at the conclusion of the inspection on August 16, 1985 to discuss the scope and findings of the inspection.

At no time during this inspection was written material provided to the licensee by the NRC Inspector.