U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-29/78-21

Docket No. 50-29

License No. DPR-3 Priority -- Category C

Licensee: Yankee Atomic Electric Company

20 Turnpike Road

Westborough, Massachusetts 01581

Facility Name: Yankee Nuclear Power Station

Inspection at: Rowe, Massachusetts

Inspection conducted: November 27 - December 1, 1978

Inspectors: Robert G Bores 1-29-79
R. J. Bores, Radiation Specialist date signed

date signed

date signed

Approved by: J P Stohr 1/29/79
J. P. Stohr, Chief, Environmental and Special Projects Section, FF&MS Branch date signed

Inspection Summary:

Inspection on November 27 - December 1, 1978 (Report No. 50-29/78-21)
Areas Inspected: Routine, unannounced inspection of emergency planning and the environmental monitoring programs for operations. For emergency planning, the areas inspected included: licensee coordination with offsite support agencies; emergency facilities, equipment, instrumentation and supplies specified in the Emergency Plan and Implementing Procedures; training of emergency personnel; Emergency Plan and Implementing Procedures; licensee records relating to emergency drills; the licensee's management controls in the area of emergency planning; and licensee action on unresolved items noted in previous emergency planning inspections. For the environmental monitoring inspection, the areas inspected included: the management controls for these programs; the licensee's program for quality control of analytical measurements; implementation of environmental monitoring programs; nonradiological effluent release rates and limits; plant secondary releases; and a followup on licensee action on previous environmental inspection findings. The inspection involved 35 onsite inspector-hours by one regionally based inspector.

Inspection Summary:

Results: Of the 12 areas inspected, no items of noncompliance were found in nine areas. Three apparent items of noncompliance (Infraction - failure to establish adequate procedures - Details, 4; Deficiency - failure to follow procedures/ training - Details, 6; Deficiency - failure to follow procedures/calibration - Details, 5) were identified in three areas.

## DETAILS

1. Individuals Contacted

Yankee Nuclear Power Station (YNPS)

*H. Autio, Plant Superintendent
*N. St. Laurent, Assistant Superintendent
*R. Aron, Technical Assistant
*W. Billings, Chemistry and HP Supervisor
J. Trejo, Health Physicist
D. Rice, Environmental Supervisor
*G. Babineau, Engineering Assistant
*E. Miles, Health and Safety Supervisor
W. Howe, Chief of Security
J. Shippe, I&C Supervisor
W. Meyers, Engineering Assistant
K. Jurentkuff, Shift Supervisor
F. Hicks, Training Supervisor
L. Laffond, Training Coordinator

Yankee Atomic Electric Company - Corporate

*D. Holsinger, Engineer - Emergency Planning
*L. Reed, Operations Quality Assurance Department
P. Littlefield, Manager, Radiological Engineering Department
J. Jow, Engineer, Radiological Engineering Department

Other Personnel

G. Parker, Director, Radiation Control Programs, Massachusetts
D. Scott, Health Physicist, Division of Occupational Health, Vermont
L. Corse, President, Whittingham (Vermont) Ambulance Service
C. Roy, Supervisor of Nursing, North Adams (Massachusetts) Regional Hospital

The inspector also interviewed several other licensee personnel of the operations, health physics and security staffs.

* denotes those present at the exit interview on December 1, 1978

Bureau of Radiation Control Programs, Massachusetts Department of Public Health
Division of Occupational Health, Vermont State Department of Health
Whitingham (Vermont) Ambulance Service
North Adams (Massachusetts) Regional Hospital

These discussions verified that the existing agreements between the licensee and these agencies remain in effect, and that the licensee's contact and coordination were adequate for these agencies to maintain an effective response capability.

No items of noncompliance were identified in this area. (See Details, 6, however, for a related matter.)

4. Facilities and Equipment

The inspector examined facilities, equipment and instrumentation to verify that items specified in the licensee's Emergency Plan and Implementing Procedures were available for use and maintained in an operable state. The inspection included examination of: a selection of four items of emergency communications equipment; radioactive release monitoring instruments - area and process monitors, and meteorological instruments; medical treatment/decontamination facilities, both onsite and at the local hospital; three emergency equipment kits; and the primary emergency coordination center (ECC) and associated supplies and equipment.

The inspector's review of this area indicated that the required facilities, equipment and instrumentation were present and operable with the following exception. Two dosimeter chargers in the ECC emergency kit and one dosimeter charger in the Control Room emergency cabinet were inoperable at the time of inspection. The licensee stated that these instruments had been operable earlier in November, 1978, during the monthly inventory and in October, 1978, for use during the site emergency drill. Prior to the completion of the inspection, these dosimeter chargers were sent to the I&C Department for repair. The inspector had no further questions regarding this item at this time.

The inspector noted that the licensee's instrumentation for emergency air sampling and analysis consisted of 30 lpm air samplers, particulate filters and charcoal cartridges, and G-M detector/ratemeter detection instruments. The inspector determined through the review of Procedure OP-3303, Revision 3, "Emergency Off-Site Radiation Monitoring"; evaluation of the available instrumentation with a Ba-133 check source; and

2. Licensee Action on Previous Inspection Findings

(Open) Unresolved Item (77-04-01): Meteorological Monitoring Procedures Review and Approval. The inspector determined through discussions with the licensee and review of contractor calibration records, that the licensee's calibration procedures had not yet been finalized in the licensee's standard procedure format, reviewed and approved. The licensee stated that since the last inspection, changes had been made in the instrumentation and in the meteorological contractor. Consequently, the procedures for the new equipment/contractor were not yet finalized/approved. The licensee stated that by January 1, 1979 this would be accomplished. The inspector stated that until the procedures are finalized, reviewed and approved by the licensee, and are subsequently reviewed by the NRC, this item remains unresolved. (See also Details, 12.e)

(Open) Unresolved Item (77-04-02): Approval of Environmental Analytical Procedures. The inspector determined through discussions with the licensee and review of the procedures, that the analytical procedures had not yet been reviewed and approved. The licensee stated that this would be done in conjunction with the new 10 CFR 50 Appendix I, Technical Specification requirements. The inspector stated that until the review and approval are performed, this item remains unresolved. (See also Details, 12.d)

(Closed) Unresolved Item (77-25-01): Clarification of Instituted Drill Program. The inspector determined through the review of the current procedures, AP-0503 "Fire Protection Training Procedures" and OP-3307 "Emergency Preparedness Exercises/Drills" and discussions with licensee personnel, that the frequency of emergency drills to be conducted and the degree of offsite agency participation have been clarified through procedural modifications. The inspector had no further questions in this area at this time.

3. Coordination with Offsite Agencies

The inspector reviewed records, procedures and written agreements relating to the licensee's coordination of emergency planning with agencies listed in the Emergency Plan and Implementing Procedures. The inspector discussed this subject with licensee representatives and persons of the following offsite agencies:

discussions with the licensee, that the above combination of procedures and equipment was inadequate for the licensee to measure an air iodine concentration of 1 X $10^{-8}$ microcuries/cc or less ($\leq$100 MPC). Procedures OP-3300, OP-3301 and OP-3302 establish airborne activity levels of < 1 X $10^{-10}$ (MPC); 1 X $10^{-10}$ to 1 X $10^{-9}$ (10 MPC); and > 1 X $10^{-9}$ (10 MPC) microcuries/cc, at the site boundary as respective parameters for defining local, site and general emergencies. The Emergency Plan requires notification of authorities at levels of 1 X $10^{-9}$ microcuries/cc. In addition, specific action recommendations are to be made to civil authorities if levels exceed 1 X $10^{-8}$, 1 X $10^{-7}$ or 5 X $10^{-7}$ microcuries/cc for specified anticipated durations.)

The inspector stated that the failure to have adequate procedures to measure established action levels of the Emergency Plan was in noncompliance with Technical Specification 6.8.1, which requires, in part, that procedures be established and followed for implementing the Emergency Plan - ANSI N18.7-1972, Section 5.3.8.3 (78-21-01). (See Details, 5 for a related item.)

The inspector noted that instrumentation was adequate to measure the action levels based on direct radiation.

5. Calibration, Inventory and Operational Checks of Emergency Equipment

The inspector reviewed a sampling of calibration, inventory and operational check records covering the period October 1977 through November 1978 for the emergency response equipment listed in the Emergency Plan and Implementing Procedures. Records reviewed covered survey instrument calibration, emergency equipment inventories/checks, emergency personnel dosimeter calibrations, emergency kit radio checks, and meteorological instrumentation calibration.

The inspector discussed with the licensee the methodology and results of calibration of the emergency kit instruments for analyzing charcoal cartridges and particulate filters. The inspector noted that the method of "spiking" the charcoal cartridge with I-131 for use in calibrating these instruments would have resulted in elemental iodide being collected on the surface of the charcoal. This could result in an overestimate of the actual counting efficiencies. The calibration of the instruments for particulate activity was also discussed, in that, the source used was a plated source of smaller diameter than the particulate filters, and was "standardized" in terms of "emissions/second in $2\pi$ geometry". The licensee's practice was to assume that the actual source strength was then twice the $2\pi$ emission rate. The inspector noted that this would tend to underestimate the actual detector efficiency since the $2\pi$ emission rate also includes backscattered beta emissions. The licensee stated that the calibration of the instruments for both the particulate and iodine cartridges would be reevaluated. The inspector stated that this item will be considered

unresolved pending completion of this evaluation and subsequent review of the evaluation/results by the NRC (78-21-02).

The inspector's review of personnel dosimeter calibration records indicated that the last calibration of personnel dosimeters for use in the emergency kits was performed on June 2, 1977. Dosimeter records examined included those for 50 R dosimeter Nos. 50-292, 50-297, 50-299, 50-306, 50-210 and 50-305 and for 200 R dosimeters 200-131 and 200-138. The latter dosimeters, as indicated by the records were last calibrated on June 1, 1977. The inspector noted that Procedures DP 85-50, Revision 3 and OP-480A require that dosimeters used in emergency kits be calibrated on an annual basis. The inspector stated that the failure to calibrate the above dosimeters in accord with the procedures was in noncompliance with TS 6.8.1 and 6.11 (78-21-03). The inspector noted that prior to his leaving the site on December 1, 1978, the licensee was in the process of recalibrating these dosimeters.

The review of this area indicated that with the exception of the items discussed above, the licensee had maintained and checked emergency related equipment as required.

6. Training

The inspector reviewed training related documentation and procedures and interviewed six persons assigned to the licensee's emergency organization to verify that training required by the Emergency Plan and Implementing Procedures had been conducted. Training since October 1978 included sessions for general employees, emergency coordinators, emergency directors, fire brigades, offsite teams, emergency security personnel, medical first aid teams, hospital and ambulance personnel and fire department personnel.

The inspector noted that Section B of Procedure AP-0504 requires both formal and practical demonstration training programs for emergency organizations specified in Section A of AP-0504 on an annual basis. The inspector noted that one of the specified organizations, Road Barrier Teams, had received no formal or practical demonstration training during the previous year. Team members were asked to review the applicable procedures/portions of the Emergency Plan and to sign their names to acknowledge that the review was performed. The inspector stated that the training received was not in accord with Procedure AP-0504, and consequently, was in noncompliance with TS 6.8.1. (78-21-04)

The inspector also noted that Section E, Procedure AP-0504 requires that the Vermont and Massachusetts Departments of Health (Radiological Divisions) be invited to attend Emergency Coordinator refresher training on an annual basis. The inspector determined that the respective Departments of Health from Vermont and Massachusetts had not been invited to attend the Emergency Coordinator Training in 1978. The inspector stated that this also constituted an item of noncompliance with TS 6.8.1 (78-21-04).

The inspector also discussed with the licensee the lack of clarity in documenting emergency training conducted; specifically, for emergency directors, whose Emergency Plan Training is included in the operator requalification training, but without documented lesson plans; and for ambulance and hospital personnel, whose training records are not maintained onsite. The licensee stated that the documentation of training would be reviewed.

The inspector determined that except as identified above, the required training had been provided.

7. Emergency Drills

The inspector reviewed the records of the radiation emergency and medical emergency drills conducted since the previous emergency planning inspection. The inspector determined that the required drills had been conducted and involved the coordination with and participation by the North Adams Regional Hospital and the Whitingham Ambulance Service.

The inspector determined that the licensee used qualified personnel to evaluate the organization's response; critiques were held during which discussions highlighted improvement possibilities; and appropriate actions had been initiated or completed to correct any areas needing improvement.

The inspector also reviewed the licensee's followup of any items identified during the 1977 radiation emergency and medical drills. The inspector verified that appropriate evaluation and resolution of drill identified improvement items had been initiated or completed.

No items of noncompliance were identified.

8. Emergency Plan and Implementing Procedures

The inspector reviewed and evaluated any changes to the Emergency Plan and Implementing Procedures and determined that the revised Plan and procedures provided the same or/higher degree of preparedness than the previous ones and that the changes had been reviewed and approved as required. The inspector noted that the revised procedures more clearly defined the frequencies for conducting emergency drills and defined the required training programs.

No items of noncompliance were identified.

9. Management Control - Emergency Planning

a. Established/Documented Program

The inspector reviewed procedures, applicable technical specifications and held discussions with responsible licensee personnel and verified that a clearly defined program of management control over emergency planning activities had been established. This program consists of: the delineation of planning responsibilities and authorities; provisions for periodic review, audits and updates of Emergency Plan implementation; and delineation of responsibility for overall conduct of reviews, audits and updates.

b. Reviews and Audits

The inspector reviewed a report of an internal licensee audit covering the Emergency Plan and Implementing Procedures conducted August 29-31, 1978. This review indicated that the licensee had identified several items requiring action. Further review indicated that all licensee audit findings for 1977 and 1978 relative to emergency planning had been evaluated and resolution was either complete or in progress.

No items of noncompliance were identified in this area.

10. Management Controls - Environmental Monitoring

a. Changes

Through discussion with licensee personnel, the inspector reviewed the licensee's organization responsible for managing the environmental programs, applicable procedures, and any changes made in the following areas since the last environmental inspection:

(1) Assignment of responsibility and authority;

(2) Provisions for audits and inspections of environmental activities;

(3) Provisions for identifying, documenting and reporting, correcting and following up on program deficiencies and inspection/audit results; and

(4) Review of program results.

The following changes were identified and reviewed by the inspector:

(1) Mr. J. Jow, Engineer, Yankee Atomic Electric Company has assumed the responsibility for review of the environmental programs and preparation of environmental radiological reports, replacing Dr. Desrosiers.

(2) All radiological environmental analyses were performed by the Yankee Environmental Services (YES) Laboratory beginning in October 1977. Prior to this time, these analyses were performed by Teledyne Isotopes, Incorporated.

(3) Meteorological instrumentation calibrations and data evaluations are performed by TRC (The Research Corporation of New England) beginning with the second half of 1978. The services were formerly performed by Environmental Research and Technology, Incorporated (ERT).

No changes were identified which would result in a decrease in the overall effectiveness of the management controls.

b. Licensee Audits/Inspections

The inspector determined that no formal audits/inspections were performed by the licensee of the Yankee (Rowe) environmental programs. The inspector noted that the licensee had no specific requirements in this area at this time.

The licensee stated that a contractor had just completed an audit of the YES Laboratory, but had not yet submitted the findings to the licensee. The licensee also stated that audits of the entire environmental program would be evaluated for implementation in the near future. The inspector had no further questions in this area at this time.

11. Licensee Program for Quality Control of Analytical Measurements

The inspector determined through discussions with licensee personnel, review of appropriate procedures, and review of program results since the end of 1976, that the program had provisions for the:

a. Assignment of responsibility to manage and conduct the program;

b. Type and minimum number of quality checks;

c. Acceptance criteria for measurement results; and

d. Followup on identified program inadequacies.

The inspector determined that the program had been operated in accordance with Procedure OP-8600, Revision 3. The results of the program indicated that samples of media, including water, milk, food, sediment and aquatic plants, were split and sent as blind duplicate samples to the YES contractor for such analyses as, gamma nuclides, tritium, Sr-89, Sr-90 and I-131. The results of this program were reviewed by the licensee with respect to established acceptance criteria. With few exceptions, the laboratory results met the acceptance criteria. When exceptions were identified, appropriate actions were taken by the licensee to resolve the discrepancies.

The inspector noted that the YES Laboratory also had an internal quality check program which included appropriate standards, spikes and blind duplicate samples. YES also provided acceptance based on documented criteria and provided for actions to resolve discrepancies.

The inspector had no further questions in this area.

12. Implementation of the Environmental Monitoring Program

a. Direct Observation

The inspector examined selected air sampling and TLD monitoring stations during a portion of the routine weekly air filter change and collection route. The inspector noted that the selected stations were located as required by the Technical Specifications (TS) and were operating at the time of inspection.

b. Review of Reports (Annual)

The inspector reviewed the Yankee Rowe Radiological Environmental Surveillance Report - January 1, 1977 to December 31, 1977. The inspector determined that the licensee had complied with the requirements of the TS in terms of environmental sampling frequencies and locations, measurements, evaluations and reporting schedules for this time interval.

c. Other Records

(1) Thermoluminescent Dosimeters (TLDs)

The inspector reviewed the results of the 1978 environmental TLD measurements to the date of inspection. The inspector discussed the TLD calibration, deployment and read-out procedures with the licensee. The inspector also examined the results of the licensee's study conducted to determine whether the air sampler shelters provide significant radiation shielding to TLDs kept inside them. The study indicates that there was no significant difference between the environmentally exposed TLDs inside and outside the air sampler shelters, based on a paired 't-test' analysis at the 95% confidence level.

No items of noncompliance were identified in this area.

(2) Air Sampling

The inspector reviewed the records of the air monitoring program for 1978 to the date of inspection and identified no items of noncompliance in this area. In discussions with the licensee, the inspector determined that air filters are no longer counted inplant prior to sending them to the YES Laboratory for analysis. This eliminates one potential source of cross-contamination of samples.

The inspector also determined that the licensee has an established program for calibration of dry gas meters and maintenance of sampler systems.

The inspector had no further questions in this area.

(3) Other Media

The inspector reviewed the records of data analyses for other environmental media including: milk, water, vegetation, fish, soil and river sediments since the beginning of 1978. The inspector found no instances in which required samples were not collected or analyzed as per the TS.

The licensee stated that the use of more specific sample medium identification, such as, fish species, type of vegetation, kind of food crop, etc., in order to establish some specific radiological levels to which previous or future measurements can be compared, would be evaluated.

The inspector had no further questions in this area at this time.

d. Environmental Sampling and Analytical Procedures

The inspector reviewed the current environmental sampling procedures and noted that all required sample media were included.

With respect to the environmental radioanalytical procedures, the licensee provided the inspector with copies for review. The inspector determined through discussions with the licensee that procedures had not been formally reviewed and approved by the licensee. The inspector noted that this had been identified as an unresolved item during the last inspection of this area (77-04-02), and that this item remains unresolved. The licensee stated that the mechanics of reviewing/approving these procedures would be evaluated and appropriate actions will be taken.

e. Meteorological Surveillance

The inspector examined the meteorological instrumentation read-out panel in the control room and noted that all of the required meteorological parameters were being collected at the time of inspection. The inspector noted that several of the recorder strip charts were not adjusted to reflect the correct time of day. (One of the charts was approximately four hours out of sequence.) The inspector also observed that a notice had been posted at the panel,

cautioning the operators to properly adjust the chart times. The inspector discussed with the licensee the importance of having correct times on the charts, especially for those instances in which the computer is inoperable and the charts must be read and correlated manually. The licensee stated that further instructions will be given to the operators in this area.

The inspector reviewed the meteorological instrumentation calibrations performed since 1978. The inspector also noted that formal calibration procedures had not yet been established and that the last calibration was performed using draft procedures by TRC. The licensee stated that the reason for lack of formal procedures at this time was due to the changes in instrumentation and contractor in June 1978. The licensee further stated that these procedures would be formalized and approved by January 1, 1979. The inspector noted that this had been left unresolved during the last inspection of this area (77-04-01). The inspector stated that this item would remain unresolved pending completion of the above actions and subsequent review by the NRC.

The inspector examined meteorological data for selected time intervals during 1977 and 1978 to assure that all operating/reporting requirements were met. The inspector determined through the correlations between the analog recorder data and computer listings, that for those intervals examined, all of the requirements were met.

13. Nonradiological Effluent Release Rates and Limits

The licensee conducts chemical and thermal monitoring of effluents in accord with the requirements of their NPDES (federal) and state discharge permits. The inspector examined selected discharge records for 1977 and 1978 with respect to frequency of measurement, types and measurement and limits imposed on the licensee. For those records examined, no instances of nonconformance with the requirements were found.

14. Plant Secondary Leakage

During the course of the environmental inspection, the inspector noted that the H-3 levels in the West Storm Drain were elevated relative to the other storm drains. The licensee stated that this was due to the steam jet air ejector (SJAE) condensate released via this pathway. The licensee also stated that during the current outage, the SJAE condensate line was rerouted to the circulating cooling water seal pit. Further

examination in this area also indicated other secondary system drains/leaks also drained to the West Storm Drain. In order to establish the quantity and concentration of this leakage to the storm drain system, the inspector examined available analyses of the secondary cooling system water and discussed system water balance. (No direct measurements were made of the SJAE blowdown or other secondary side losses other than steam generator blowdown.) The licensee stated that the secondary cooling water is routinely analyzed (typical H-3 levels are $1E^{-4}$ µCi/cc) and the discharges of H-3 are accounted for by assuming that the total volume of the daily makeup to that system (about 15,000 gallons) is discharged. More than one-third of the loss is accounted for by the steam generator blowdown which is monitored. The inspector determined through discussions with the licensee and review of available records, that the current record system at Yankee Rowe does not account for H-3 discharges from the secondary side, other than from steam generator blowdown. The licensee stated that this was an oversight and that the effluent records program would be modified to include the balance of secondary H-3 discharges. The inspector noted that the current TS were not specific in this area; that the concentrations of H-3 in the West Storm Drain were well within the NRC limits; and the total H-3 releases from the secondary system were only a couple of percent of the total Yankee Rowe releases. The inspector stated that until the effluent records program was modified to account for all the secondary system losses, this item is considered unresolved (78-21-05).

15. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items or items of noncompliance. Unresolved items disclosed during this inspection are described in Details, 2, 5, 12.d, 12.e and 14.

16. Management Interview

On December 1, 1978, the inspector met with licensee representatives (denoted in Detail, 1) at the conclusion of the inspection. On December 15, 1978, a telephone discussion was held between Dr. Bores and Mr. J. MacDonald of Yankee Atomic Electric Company. On January 9, 1979, a telephone discussion was conducted between Dr. Bores and Mr. Autio.

During these meetings/discussions, the purpose and scope of the inspection were summarized and the inspection findings, including each item of noncompliance and unresolved item was discussed.

With respect to the item of noncompliance (78-21-01) - failure to have adequate procedures/equipment to implement a portion of the Emergency Plan, the licensee stated that the Emergency Plan and Implementing Procedures would be revised along the lines of the EPA Protective Action Guides. In the interim, procedures would be modified to enable air samples to be analyzed in plant (if accessible) or at Vermont Yankee Nuclear Power Plant to insure required sensitivities are met.