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Region I

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Licensee: Yankee Atomic Electric Company
1671 Worcester Road
Framingham, Massachusetts 01701

Facility Name: Vermont Yankee

Inspection at: Vernon, Vermont

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SUMMARY

The appraisal of the state of onsite Emergency Preparedness at Vermont Yankee involved six general areas:

emergency organization;
emergency training;
emergency facilities and equipment;
procedures which implement the emergency plan;
coordination with offsite agencies; and
walk-throughs of emergency duties.

The emergency organization was well defined, but the site's augmentation capabilities did not meet the augmentation goals of NUREG-0654.

The training program was found to be generally adequate and was very extensive with a large number of personnel trained to perform emergency functions such as offsite monitoring.

Emergency facilities and equipment were for the most part satisfactory; however, deficiencies were noted in several areas including post-accident sampling.

Procedures, which implement the Emergency Plan, were generally adequate; however, deficiencies were identified in several areas, including: Emergency Action Levels, communication of protective action recommendations to offsite officials and call-in of off-duty personnel.

Observation and questioning of selected individuals during walk-throughs of their assigned emergency tasks and functions indicated that the individuals were aware of their assignments and their part in the emergency organization.

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1.0 ADMINISTRATION OF EMERGENCY PLAN

The auditors reviewed the Emergency Planning Coordinator's (EPC) job description, and discussed this subject with the onsite EPC. The EPC was part of the onsite plant staff The EPC job description specified that he/she was responsible for the development and maintenance of the Emergency Plan, coordination of drills and exercises, providing State and local training, assuring emergency equipment was functional, ensuring emergency training of onsite personnel was performed and acting as the plant NRC interface on emergency planning items.

The EPC reported to the Chemistry and Health Physics Supervisor. Discussions with the plant EPC indicated he had access to the Plant Manager; however, this was not specified in the job description. The plant EPC stated that he was receiving adequate management support.

The Corporate Organization had an EPC responsible for emergency planning as it related to interfaces with State and local offsite agencies. Discussion with the licensee onsite staff indicated that daily contact was maintained with the Corporate EPC.

The job description specified qualification criteria and the plant EPC appeared to meet these criteria.

The plant EPC had attended several workshops on emergency preparedness and was scheduled to attend upcoming courses on emergency preparedness. However, there was no formal training program for the EPC.

Emergency Plan and procedure changes were reviewed by the Plant Operations Review Committee (PORC). The plant EPC stated he routinely attended the PORC meetings to present emergency preparedness items.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following matters should be considered for improvement:

- Provide, in the onsite EPC job description, the authority to contact the Plant Manager directly as needed on emergency planning issues. (50-271/82-05-01)

- Formalize the provisions for ongoing training of the plant EPC. (50-271/82-05-02)

2.0 EMERGENCY ORGANIZATION

2.1 Onsite Organization

The auditors reviewed Emergency Plan Table 8.1 and emergency implementing procedures OP 3500, OP 3501, OP 3502 and OP 3503 which outlined the actions to be performed by plant personnel during various emergencies. The auditors also reviewed the Emergency Personnel Assignment List.

Table 8.1 specified, by normal job title, those personnel qualified to perform emergency organization management functions.

The Emergency Personnel Assignment List specified the personnel qualified to perform nonmanagement emergency functions. This list also contained those mechanics, welders, and electricians qualified to perform repair and corrective actions under accident conditions (e.g., work in SCBA and in high radiation fields). Personnel were assigned to the list based on training and work experience. Interviews and training record checks appeared to confirm that the personnel were qualified. However, the list was informal and was not addressed by a procedure to ensure the continuous qualifications of personnel.

Assignments corresponded to the emergency organization elements shown in Emergency Plan Figures 8.2, 8.3, 8.4, and 8.5. These figures demonstrated that except for licensee representation at the State EOC, repair and corrective actions, and radwaste operation, the appropriate emergency functions were provided. The licensee indicated that radwaste operations fall under the Operations Supervisor in the TSC. Licensee personnel stated that a representative would be sent to the State EOCs at the request of the State; but, this was not formalized. Repair and corrective action personnel would be provided to the OSC from the EOF where the pool of qualified personnel identified on the Emergency Personnel Assignment List would assemble.

The immediate on-shift emergency organization was shown in Emergency Plan Figure 8.1. The Emergency Director (Shift Supervisor) had the immediate authority and responsibility to initiate emergency actions and to make protective action recommendations offsite. Once the TSC Coordinator arrives onsite and activates the EOF, the responsibility for interface with offsite officials was transferred to him/her. Once onsite, the TSC Coordinator had overall control of the emergency response with emphasis on onsite actions until the Recovery Manager arrives. The Recovery Manager was a corporate level officer (Manager of Operations or Operations Support Manager). Upon his arrival, the Recovery Manager has overall management control. However, it was not clear exactly what specific responsibilities would be assumed by the Recovery Manager or how appropriate parties would be informed that the Recovery Manager had assumed these responsibilities. This could result in inaction or confusion.

The auditors interviewed personnel who would perform the functions of Recovery Manager, TSC Coordinator, and Emergency Director. These personnel described their roles during an emergency and these corresponded to those described in

the Plan and procedures. The Recovery Manager stated there could be some confusion concerning who was the plant point of contact with offsite officials as this responsibility was transferred during the augmentation process.

Twenty-four hour offsite H.P. support was available through the Yankee Mutual Support Agreement from Nuclear Services Division (NSD), Vermont Yankee, and Maine Yankee. The licensee had not specified criteria for assigning personnel to emergency functions; however, the licensee indicated that assignments corresponded to normal work experience and was supported by training. The auditors found this to be the case for those personnel interviewed.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following matters should be considered for improvement:

- Provide for notifying appropriate personnel when key emergency functions (e.g., offsite protective action recommendation) are transferred to the Recovery Manager. (50-271/82-05-03)

- Provide a procedure to maintain the Emergency Personnel Assignment List to ensure that personnel are qualified; that the appropriate emergency functions are addressed; and sufficient coverage is maintained. (50-271/82-05-04)

- Provide specifically for radwaste operations and representation at the State EOCs (if requested) in the emergency organization. (50-271/82-05-05)

2.2 Augmentation of Onsite Emergency Organization

The auditors reviewed Emergency Plan Section 8, and interviewed NSD management personnel to include the Radiation Protection Manager. NSD personnel were headquartered in Framingham, Massachusetts, about a 2-hour drive from the site. NSD support was coordinated through the Engineering Support Center (ESC) located in Framingham, Massachusetts. NSD support was activated from the site by a pager system. The licensee would be provided with INPO support in accordance with the emergency response plan of this organization. This assistance would be requested through the ESC.

NSD augmentation addressed all the appropriate major emergency functional areas. The NSD organization was shown in Emergency Plan Figure 8.6, and interfaces with onsite emergency centers were also shown in the Emergency Plan. It appeared NSD personnel were assigned to functions that reflect their work experience.

The licensee minimum backshift organization was shown in Emergency Plan Figure 8.1. The backshift failed to meet the minimum guidelines of NUREG-0654, Table B-1 by the following:

1 - SRO,
1 - communicator, and
1 - Chemistry technician.

The licensee will fill the SRO position by July, 1982. However, neither provisions to supply a chemistry technician, or communicator within 30 minutes in accordance with NUREG-0654, Criteria B-5 nor a discussion of compensatory measures were provided.

On April 14, 1981, the licensee submitted a letter that identified, by normal job assignments, the number of personnel who lived within 15, 30, 45 and 60 minutes travel times of the site. This submittal also stated that the necessity of performing more radiological duties than can be supported by the current on-shift staff did not exist in the early time frame following an accident. In addition, it stated that a communicator would be assigned by the Shift Supervisor. Since this submittal did not specify the time required to notify the off duty personnel, or their emergency functions, an evaluation against the augmentation goals of NUREG-0654 could not be made. The licensee also did not support the conclusion that the backshift health physics/chemistry staff (one technician) was sufficient during the early time frame following an accident. The submittal also did not demonstrate that the person assigned to be communicator would not have any other emergency functions that would prevent him/her from performing as a communicator.

In addition, the licensee had not conducted a backshift drill to confirm the actual times required to augment the onsite organization in several years. However, drills had been conducted to determine the time required to notify the personnel by the pager system.

Augmentation personnel are assigned by use of a tag board in the EOF. All personnel were trained to take assignments in the order of the numbered tags on the board.

Based on the above findings, improvement in the following area is required to achieve an acceptable program:

- Perform a study to determine how the intent of the augmentation goals of NUREG-0654, Table B-1 can be achieved after the declaration of an emergency. The results of this study will be documented and a copy forwarded to NRC Region I office for review and evaluation along with a description of compensatory measures for any augmentation goals not met. (50-271/82-05-06)

3.0 EMERGENCY PLAN TRAINING/RETRAINING

3.1 Program Established

The auditors reviewed Emergency Plan Section 12.2 and Procedure AP 3712. The auditors also interviewed licensee personnel who developed and who would implement this procedure to include the Plant Training Supervisor, the Emergency Planning Coordinator, and the Plant Chemist.

Procedure AP 3712, outlined the licensee's emergency training program. The program provided for annual training/retraining of individuals with emergency functions, and also some employees with no assigned emergency functions. The Plant Training Department was responsible for the training of Emergency Coordinators and Radiological Assistants, Plant Emergency Directors, Plant Emergency Assistance Personnel, fire brigade commanders and members, local fire department, emergency medical team members, and the security force. The Chemistry and Health Physics Department was responsible for training of local medical support personnel and state/local governments. The Public Relations Department was responsible for annual briefing of the news media. These training categories are consistent with categories in NUREG-0654 (Part II, Section O).

All plant personnel, except clerks and secretaries, had been trained for emergency duties. Approximately 90 workers had been trained as Plant Emergency Assistance Personnel, and could perform duties such as offsite radiation monitoring, communications, and search and rescue. In addition, approximately 60 workers have received the training for Plant Emergency Director and approximately 20 workers for Emergency Coordinators/Radiological Assistants. This extensive training program should aid in rapidly filling emergency positions during an accident situation.

The licensee had formal lesson plans for the basic categories of training. Lesson plans had clearly stated objectives, and written examinations were given upon completion of training. These examinations provided a good test of an individual's ability to perform their assigned emergency duties. Records were kept on all individuals who had received training. In addition, hands-on training had been provided for many functions (e.g., use of SCBA, survey instruments, dose rate nomogram and EOF tag board). However, the licensee had no provisions in AP 3712 to train members of the emergency organization when changes to procedures and equipment would occur in the period between the scheduled training sessions.

The auditors noted that the licensee had no provisions for offering emergency training to the officers of fire, police and ambulance/rescue companies who had mutual aid agreements with the licensee's primary fire, police, and ambulance/rescue companies.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following matters should be considered for improvement:

- Offer emergency training to the officers of fire, police and ambulance/rescue companies who have mutual aid agreements with licensee's primary support companies. (50-271/82-05-07)

- Provide for training workers on major emergency procedure and equipment changes to include hands-on training if applicable. (50-271/82-05-08)

3.2 Program Implementation

The auditors reviewed training records for individuals assigned emergency functions as well as general employees with no emergency functions. The auditors also interviewed licensee personnel who were listed as being trained to perform certain emergency functions.

The auditors determined from a review of available training records that most individuals had been trained in their emergency functions. Records could not be found for the training of offsite medical personnel; however, interviews confirmed that training had been performed.

Discussions with emergency personnel indicated that their training was consistent with that outlined in the Plan and procedures. The auditors interviewed licensee personnel who would perform the following functions during an emergency: Emergency Director, TSC Coordinator, Recovery Manager, EOF Coordinator, Radiological Assistant, offsite monitoring, Security Coordinator and repair and corrective actions (e.g., plant mechanics). Those interviewed were knowledgeable of their emergency responsibilities and functions. Interviews with several personnel trained as Radiological Assistants indicated they felt the person filling this position had too many responsibilities. This was supported by the EOF walk-through (see Section 7.2 of this report) where the designated Radiological Assistant indicated he would delegate the dose calculations to a assistant. A recent exercise also indicated the Radiological Assistant was overloaded with work.

Control Room walk-through detailed in Sections 7.2 and 5.3.1 of this report, indicated several Emergency Directors/Shift Supervisors had difficulty in correctly classifying accidents. In addition, they did not promptly initiate dose calculations. This would be important in an emergency, as dose calculations would be one criteria used to determine if conditions warrant a higher classification. Difficulties in using the nomogram and TI-59 calculator to calculate dose rate were also observed during the Control Room walk-throughs. Additional training appears to be needed in these areas.

During the post-accident sampling walk-through (see Section 7.2 of this report), and interviews with personnel who would perform accident sampling/analysis, the auditors noted that additional training should be provided in the following areas: 1) exposure levels which may be encountered during post-accident

sampling/analysis 2) methods for counting high-level samples in the plant counting room and 3) in the reasons for obtaining post-accident samples and stack samples during an emergency.

Based on the above findings, this portion of the licensee's program appears to be adequate but the following matters should be considered for improvement:

- Provide additional training to Emergency Directors/Shift Supervisors in classifying accidents and in initiating dose calculations (i.e., either doing the calculations themselves or delegating to an HP tech or STA). (50-271/82-05-09)

- Provide additional training to individuals who perform dose calculations including use of the offsite dose rate nomogram and TI-59 calculator. (50-271/82-05-10)

- Provide additional training to personnel who would perform post-accident sampling/analysis and main stack sampling/analysis to include typical exposure rates that may be encountered during the above procedures and in methods for counting high-level samples using the plant Geli system. (50-271/82-05-11)

- Review the responsibilities of the Radiological Assistant and determine the need for delegating some of the individual's duties during an emergency. (50-271/82-05-12)

- Assure that records are kept on training of offsite medical personnel. (80-271/82-05-13)

4.0 EMERGENCY FACILITIES AND EQUIPMENT

4.1 Emergency Facilities

4.1.1 Assessment Facilities

4.1.1.1 Control Room

The auditors reviewed Emergency Plan Sections 3, 6, 8 and 9, the Emergency Plan Implementing Procedures (series OP 3500), and inspected the Control Room complex.

The Control Room was located on the third floor of the administration building and appeared adequate in size and layout for its emergency functions. The Shift Supervisor's office was the storage location for the emergency kit, plant prints and procedures not relevant to immediate Control Room operations. Routine and emergency operating procedures, including the Emergency Plan and Implementing Procedures were located at the Control panel operators' work station. It was noted that one copy of the Emergency Plan and Implementing Procedures was available in the Control Room. Shift Supervisors indicated that procedures would be removed from the binder and distributed as necessary to Control Room emergency stations.

The Shift Supervisor's office was the designated location for dose assessment and included radio communications capability for survey team control. An area map with plume dispersion overlays and a site boundary dose nomograph were mounted on the wall. This room appeared adequately removed from Control Room operations to minimize interference. The Control Room did not contain a usable copy of the thyroid dose nomograph.

Items listed in procedure OP 3506.02 as contained in the Control Room emergency kit were all noted to be present. Several items present were not specifically listed including 6 charcoal air sample cartridges, 2 pair of protective clothing and paper cups for administering potassium iodide solution.

The Nuclear Alert System notification phone was located in a cabinet immediately underneath the operating procedures storage area directly in front of the main board. As discussed in Sections 4.2.3 and 7.2 of this report, this location was noted to be inconvenient for the operator and could interfere with Control Room operations.

Particulate (HEPA) and charcoal filters had not been installed in the Control Room ventilation system. Licensee personnel indicated that a study of the need for these features was in process but a final decision had not been made. The licensee's current practice was to isolate the Control Room ventilation system with recirculation of Control Room air. Some minor modifications to provide tighter isolation had been made.

Implementation of Control Room habitability monitoring required direction from the Emergency Director or TSC Coordinator. Air sampling and dose rate monitoring would be performed using portable equipment prepositioned in the Control Room but requiring manual set up and operation. Although an area radiation monitor was not installed directly in the Control Room, one was located in the corridor immediately outside. This unit should provide a reasonable and conservative approximation of Control Room direct radiation dose rate, and identify the need for closer dose rate monitoring should conditions warrant.

Based on the above findings, this portion of the licensee's program appeared adequate, but the following items should be considered for improvement:

- Provide thyroid dose nomograms in the Control Room. (50-271/82-05-14)

- Complete the study evaluating the need for HEPA and charcoal filtration of the Control Room ventilation system and document the conclusions to the Nuclear Regulatory Commission. (50-271/82-05-15)

4.1.1.2 Technical Support Center (TSC)

The auditors reviewed Emergency Plan Sections 6 and 9, and inspected the TSC.

The TSC was located on the second floor of the Administration Building and included adequate communications, the plant print file room, the computer room, and a number of offices. Its location was convenient to the Control Room, and its size was adequate for the personnel assigned. The emergency kit, records, and communications equipment were stored in the communications center which was normally a conference room. Copies of the Emergency Plan, Implementing Procedures, plant prints, and the FSAR were maintained in the Print File room. Additional copies of the Plan, Implementing Procedures and certain other documents were also available in the TSC. The licensee had added two inches of concrete to the floor above the TSC as shielding. Four area radiation monitors had been added to provide TSC dose rate habitability coverage.

Office space for various subgroups within the TSC organization had not been specifically designated. The licensee's intent was to assign specific offices for specific functions as the need arose. Likewise, specific office space for the NRC had not been designated; however, providing such space would not appear to be a problem.

The conference room/TSC communications center included white boards and felt-tip markers for noting plant status and other information. The white boards did not provide any format or identification of what information would be available.

The TSC communications center included the plant radio, one commercial phone extension, the plant page phone, and the NRC Emergency Notification System hot line. Other commercial phones and plant page phones were located in various offices in the TSC. The NRC Health Physics Network phone was located downstairs from the TSC in the OSC. It was noted that the communications center had

become extremely crowded during a recent emergency exercise. Relocation of status boards to positions where they could be more readily visible to TSC personnel could reduce the need for entry to the communications center. Spreading phones out over a large area might also make the center function more smoothly, as might the use of head sets.

Based on the above findings, this portion of the licensee's program appears adequate, however, the following item should be considered for improvement:

- Provide designated office space for each major TSC functional subgroup; and take steps to reduce crowding and confusion in the TSC communications center. (50-271/82-05-16)

4.1.1.3 Operations Support Center (OSC)

The auditors reviewed Emergency Plan Section 6, held discussions with licensee staff representatives and inspected the primary and alternate OSC.

The OSC was located, as described in the Emergency Plan, on the first floor of the Administration Building. Included in the OSC were the normal health physics offices, control point, chemistry and radiochemistry labs, counting room, decontamination showers and several other facilities. The size appeared adequate for assigned personnel. Specific emergency materials had not been designated for storage at the OSC; however, it was noted that health physics instruments (including numerous high-range survey meters), protective clothing, laboratory supplies and respiratory protection equipment would be readily available from normal supplies. The auditors concluded supplies would be adequate for emergency use. Adequate communications, including commercial phone, plant page, NRC Health Physics Network phone, and radio, were available in the office areas, as were copies of the Emergency Plan and Implementing Procedures.

The functions of the OSC would be transferred to the EOF in the event that the OSC became uninhabitable.

Based on the above findings, this portion of the licensee's program appeared adequate.

4.1.1.4 Emergency Operations Facility (EOF)

The auditors reviewed Emergency Plan Sections 6 and 8, and the Emergency Plan Implementing Procedures (series OP 3500), and held discussions with licensee personnel. In addition, a walk-through of the EOF activation and functioning was observed. The auditors also inspected the alternate EOF.

The EOF has been located at the Visitor Information Center and included provisions for direction, evaluation and coordination of all licensee activities related to an emergency. The EOF would be directed by the site Recovery Manager and under the immediate control of the EOF Coordinator. During intermediate

accident phases, the EOF would coordinate offsite radiological assessment (surveys and dose projection) and provide communications interface with offsite agencies.

The EOF was equipped as stated in the Emergency Plan and Implementing Procedures. The walk-throughs of activation showed that four people could effectively set up the EOF within about 10 minutes. Equipment was stored in several large wheeled boxes which could readily be rolled by one person. During the walk-through, a licensee staff member indicated that the Eberline SAM-II used for air sample counting would be relocated from the EOF storage room to the radiation monitoring team assembly area. Since the licensee has experienced lengthy (1-2 hour) warm-up times for the SAM-II to stabilize, a better approach might be to leave it on and in the equipment storage room.

The EOF appeared to be adequately equipped with procedures, plans, maps, monitoring equipment, and communications. Adequate space was available for the assigned functions. Direct plant parameter readouts were not provided at the EOF, however, communication links with the Control Room appeared adequate to transmit the required data.

The alternate EOF was located in the basement of the Vernon Town Hall which was about the same distance from the plant stack although in a wind sector 80 degrees removed from the primary EOF. The equipment stored there was as specified in the Emergency Plan and could easily be supplemented by equipment from the primary EOF. Shifting wind conditions during accidents involving major releases could affect the habitability of both EOFs simultaneously; however, some added (though undetermined) protection could be gained by the alternate EOF (AEOF) location in a below grade masonry structure. In a March 22, 1982 meeting of licensee and NRC management personnel, the licensee proposed establishing an EOF at its corporate office in Battleboro over 7 miles from the site. This proposal has been submitted to the NRC in a letter dated April 14, 1981. An agreement was reached to take appropriate action following completion of the NRC staff review of the April 14, 1981 proposal. Communications equipment at the AEOF appeared adequate for state, local and licensee links; however, NRC ENS and HPN lines were not available in the AEOF.

Based on the above findings, this portion of the licensee's program appeared adequate, however, the following items should be considered for improvement:

- Designate and equip an AEOF sufficiently distant from the site that it would not be rendered uninhabitable by shifting meteorology conditions (following review of the proposed AEOF location by NRC HQ.) (50-271/82-05-17)

- Establish a location for the Eberline SAM-II air sample counter such that it need not be unplugged thereby eliminating the required warm-up/stabilization time. (50-271/82-05-18)

4.1.1.5 Post-Accident Coolant Sampling and Analysis

The auditors reviewed the licensee's implmenting of NUREG-0737, paragraph II.B.3, post-accident coolant sampling and analytical capabilities to verify that the licensee had the ability to sample and analyze high-range activity (up to 10 Ci/g) reactor coolant samples during accident conditions. The auditors inspected the licensee's final reactor coolant sampling provisions, reviewed sampling procedures (see Section 5.4.2.4 of this report), and discussed design parameters with members of the chemistry and health physics staff.

The reactor coolant sampling system was located on the 252 foot elevation of the turbine building within the corridor access to the heater bays. The design reviews submitted by the licensee's engineering staff stated that the location would be accessible but a shield wall in front of the sampling panel was required to reduce the overall dose rate to less than 1 R/hr. The auditors noted that NUREG-0578 and Regulatory Guide 1.4 source terms were assumed for the evaluation rather than NUREG-0737 source terms. However, no discrepancies between the assumptions existed since the maximum concentration that the licensee expects to sample during a worst-case accident was calculated at 5.1 Ci/cc. All off-gases from the sample system would be ventilated to the stack but filtration for the post-accident sampling system was not provided. The licensee's evaluation showed that the maximum potential off-site exposure due to the operation without charcoal adsorbers or HEPA filters would only be a small fraction of 10 CFR Part 100 limits.

The auditors inspected the sample panel that was shielded with a 3' concrete wall. A schematic of the flow paths for purging, sample collection, and dilution was drawn on the sample panel. Reach rods were installed to manipulate valve alignment. The auditors noted during a walk-through (see Section 7.2 of this report) that the reach rod became disengaged and could not turn the valve. Discussions with the licensee indicated that the same problem existed with another reach rod during a training drill. Depending on when the reactor coolant entered the post-accident sampling system, a failed valve alignment could not be corrected without excessive exposure. With proper set-up, the licensee stated that more than one sample could be withdrawn.

Although the area was not monitored with installed instrumentation, team members would take high-range survey instruments as part of the sampling procedure. A shielded syringe was provided to withdraw a 1 ml gas sample into an evacuated 14 ml gas sample bottle. A liquid sample would be tapped at the liquid port with the capability to withdraw 3 ml of diluted reactor coolant at one time. A hand-carried lead brick with carved-out holes for the sample bottle was the only shielding provided for transporting samples to the analysis laboratory. All equipment was dedicated for post-accident reactor coolant sampling.

The in-plant chemistry lab and health physics counting room appeared to have adequate instrumentation and procedural capability for evaluating samples for chlorides, boron, conductivity and fission products. However, the auditors

noted that although boron and chloride analysis capability was available, testing would not be done on an immediate basis. The licensee stated that these capabilities would only be utilized following a management decision that exposure associated with such a sample is warranted. The auditors were unable to determine the maximum concentrations that the licensee would analyze. Concerning conductivity measurements, the licensee was not aware that these measurements were required within 3 hours after declaration of an emergency situation (see Section 5.4.2.5 of this report).

Based on the above findings, improvement in the following area is required to achieve an acceptable program:

- Inspect and repair as necessary the reach rod couplings for the post-accident reactor water sampling panel to ensure improved valve manipulation. (50-271/82-05-19)

In addition to the above finding, the following matters should be considered for improvement:

- Provide adequate shielding for transporting high-activity reactor coolant samples to the analysis laboratory. (50-271/82-05-20)

- Determine the maximum reactor coolant sample concentration that could be analyzed under worst-case accident conditions. (50-271/82-05-21)

4.1.1.6 Post-Accident Containment (Air) Sampling and Analysis

The auditors reviewed the licensee's implementing of NUREG-0737, paragraph II.B.3 post-accident containment sampling and analytical capabilities to verify that the licensee had the ability to sample and analyze high-activity containment air samples during accident conditions. The auditors inspected the licensee's final containment sampling provisions, reviewed sampling and analytical procedures (see Sections 5.4.2.6 and 5.4.2.7 of this report), and discussed design parameters with members of the chemistry and health physics staff.

The final containment sampling point was located on the 252 foot elevation at the redundant hydrogen analyzer outside the reactor building. The design review submitted by the licensee and engineering staff stated that the location would be accessible and recommended two half value thickness of shielding in front of the hydrogen analyzer for better radiation protection. In addition another design study recommended a 40 cm^3 sample bomb with 1 1/2" of lead shielding. The auditors noted that lead and steel shielding was installed and the 40 cm^3 sample volume with 2" of lead shielding was chosen as the sample cask. The evaluation did not use NUREG-0737 source terms, because the initial design study was completed prior to issuance of NUREG-0737. However, the source terms were determined using Regulatory Guide 1.4 and therefore presented no discrepancy.

Two sample bombs and shielded casks (one for purging the line before withdrawing a sample) were available. In addition, dilution bottles and syringes were dedicated for post-accident sampling. The licensee had intended to use a shielded syringe but extra long needles to penetrate the length of the sample cask were not available but have been ordered. As designed, the containment sample could be collected and analyzed without removing the 40 cm^3 sample bomb from its shielding, except for the moment of release from the sample tap via quick-disconnects. No studies were performed by the licensee to determine if significant sample losses due to plate-out of iodine were evidenced for the chosen sample/dilution technique.

The in-plant chemistry laboratory and health physics counting room appeared to have adequate instrumentation for performing hydrogen and oxygen concentrations, and gross fission product inventory. Two backup counting facilities, the mobile van and environmental laboratory were also specified as having the capabilities for post-accident analysis. To provide adequate quantification for iodines in the containment atmosphere, the licensee stated they would count the diluted gas sample (14 ml vial geometry) on a Ge(li) system. An empirical study using NUREG-0737 source terms indicated the Ge(li) system would be able to count for iodine(s) without significant interferences from a large noble gas to iodine ratio. However, the auditors were unable to determine the maximum concentrations that could be analyzed.

Based on the above findings, improvement in the following area is required to achieve an acceptable program:

- Evaluate whether the containment samples are representative because of iodine plate-out in the sample vials and correct any deficiencies identified. Provide a written report of the results of the evaluation to the NRC Region I office. (50-271/82-05-22)

In addition to the above findings, the following matter should be considered for improvement:

- Determine the maximum containment sample concentrations that could be analyzed under worst-case accident conditions. (50-271/82-05-23)

4.1.1.7 Post-Accident Gaseous and Particulate Effluent Sampling and Analysis

The auditors reviewed the licensee's implementation of NUREG-0737, paragraph II.F.1-2, post-accident sampling and analysis capabilities of gaseous effluent streams to verify that the licensee had the ability to sample and analyze high-activity gas and particulate effluent during accident conditions. (High-range noble gas monitoring was also reviewed and discussed in Section 4.2.1.1 of this report).

The licensee stated that all elevated gaseous effluent releases would be discharged from the plant stack via the stand-by off-gas treatment facility. As a result of a licensee shielding design study, the post-accident stack

sampling system was installed outside the stack building to limit personnel exposures. This location appeared to be accessible since entrance into the stack was not necessary. High-range survey meters would be taken to the sampling location to monitor the area during sampling.

The auditors noted that the in-plant chemistry lab and radiation protection counting room appeared to have adequate instrumentation. A plexiglass attachment for increasing distances and assumptions regarding counting efficiency at these distances was available. However, procedural capability for diluting samples by breaking apart a cartridge were not specified (see Section 5.4.2.9 of this report).

Based on the above findings, this portion of the licensee's program appears to be adequate.

4.1.1.8 Post-Accident Liquid Effluent Sampling, and Analysis

The auditors discussed with the licensee provisions for sampling, analyzing transferring, and storing liquid waste which could be generated during accident scenarios. The licensee stated that three 10,000 gallon waste sample tanks were located outside the reactor and turbine buildings, and would be the only ones that could discharge any liquid waste. The licensee stated no high-activity wastes would be pumped to these tanks because it would violate their Technical Specifications. Therefore, all sampling during an emergency condition would be done from the torus. However, no special equipment for sampling, shielding or analysis had been dedicated for high-activity liquid waste.

The licensee stated that they would not release any liquid effluents during an emergency because they had adequate storage capability. A review of the floor drain, collector and sampling tanks indicated an inventory of 100,000 gallons with the abiltiy to store any high-level waste into the torus (500,000 gallon capacity). The licensee indicated some scheme for controlling high-activity liquid waste should be maintained.

Based on the above findings, this portion of the licensee's program appears to be acceptable, but the following matter should be considered for improvement:

- Develop plans and procedures for post-accident sampling and analysis of liquid from systems known to be contaminated or normally contaminated with radioactive material. The procedure should contain the following guidance:

  whether the liquids can or should be transferred to other storage facilities, processed or discharged; precautions to be taken during sampling; and immediate actions required to evaluate the radiation levels of the liquids. (50-271/82-05-24)

4.1.1.9 Offsite Laboratory Facilities

The auditors reviewed Emergency Plan Section 6 and interviewed members of the licensee staff and visited the offsite laboratory facilities during a previous audit.

There were provisions for fixed or mobile laboratory facilities to support monitoring and isotopic analyses of both environment and high-activity samples and onsite exposure control and recordkeeping. This laboratory capability provided for dedicated instrumentation which was maintained, calibrated, routinely checked and repaired. For this capability, the licensee uses the services of a mobile laboratory from the Yankee Atomic Environmental Laboratory, located at Framingham, Massachusetts. The mobile laboratory can respond to the site area within about 2 to 3 hours.

Based on the above finding, this portion of the licensee's program appears to be adequate.

4.1.2 Protective Facilities

4.1.2.1 Assembly/Reassembly Areas

The auditors reviewed Emergency Plan Sections 6 and 10 and procedures OP 3501, OP 3502 and OP 3503.

In case of a Site or General Emergency, licensee employees would report to the Governor Hunt House (EOF). If this location becomes radiologically uninhabitable, the alternate location would be the Town Hall in Vernon, Vermont (AEOF). Both of these facilities are located within a mile of the plant stack. No provisions have been made to relocate to a predetermined location out of the immediate plant area if conditions warranted such actions.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following matter should be considered for improvement:

- Provide an assembly area outside of the site area that could be used under conditions requiring immediate evacuation of the nearby site and as a reassembly area for reentry operations. (50-271/82-05-25)

4.1.2.2 Medical Treatment Facilities

The auditors reviewed Section 10 of the Emergency Plan, Procedure OP 3508, and interviewed members of the licensee's staff, members of the Brattleboro Memorial Hospital and Rescue Inc. Ambulance Service. Facilities, equipment and treatment rooms at the site and hospital were also inspected.

The licensee had made an agreement with Rescue Inc. Ambulance Service for emergency transport of injured or contaminated personnel from the site. Provision of annual training by the plant was included in this agreement. The

Rescue Inc. supervisor indicated the annual training was supplemented by occasional site orientation tours, and ongoing refresher training held by Rescue Inc.

Arrangements had been made with Brattleboro Memorial Hospital for the treatment of injured or contaminated individuals. The treatment facilities and supplies maintained at the hospital appeared adequate. Provisions for contamination control and storage of liquid and solid contaminated waste also appeared adequate. Training of hospital staff included two lectures and two drills per year. The staff appeared confident and capable to properly handle contaminated injuries.

Additional arrangements have been made with Peter Bent Brigham Hospital in Boston to provide treatment and consultation for serious cases of radiation exposure or radioactivity uptake. These arrangements appeared adequate.

The licensee maintained a medical services room adjacent to the OSC. This room contained stockpiled supplies for onsite response and was maintained by the plant nurse. Additional supplies (first aid kits, litters, etc.) were maintained at designated locations throughout the plant.

Based on the above findings, this portion of the licensee's program appeared adequate.

4.1.2.3 Decontamination Facilities

The auditors reviewed Emergency Plan Section 10 interviewed plant health physics personnel and inspected decontamination facilities and equipment.

The licensee had provisions for decontamination at all assembly areas including the HP control point, EOF, and alternate EOF. Routine decon supplies would be used at the HP control point while the EOF and alternate EOF had appropriate supplies stored in a 55-gallon drum for emergency use. The auditors noted there were no facilities for showering or provisions for liquid waste disposal at the alternate EOF. Procedures for decon were not found at decon locations.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following matters should be considered for improvement:

- Provide for showering contaminated persons at the alternate EOF and for liquid waste disposal. (50-271/82-05-26)

- Provide copies of decontamination procedures at each decontamination location. (50-271/82-05-27)

4.1.3 Expanded Support Facilities

The auditors interviewed licensee personnel and reviewed the Emergency Plan.

The licensee indicated that the only support facilities that are available for use by offsite nonlicensee support personnel were located at the EOF and the alternate EOF. The licensee had not conducted a survey to identify other possible locations that could support nonlicensee personnel.

Based on this finding, this portion of the licensee's program appears to be acceptable, but the following matter should be considered for improvement:

- Conduct a survey to identify local resources that could be used to support the expanded emergency organization that would respond to an emergency. (50-271/82-05-28)

4.1.4 News Center

The auditors reviewed Emergency Plan Sections 6 and 8, procedures AP 0835, OP 3502 and OP 3503. The auditors interviewed licensee personnel who would implement these procedures.

The news media center was located at Dalems Chalet and was large enough to accommodate approximately 200 media representatives. A PA system and telephones were in service. The licensee had provisions for media badging and security control.

Based on the above findings, this portion of the licensee's program appears to be adequate.

4.2 Emergency Equipment

4.2.1 Assessment Equipment

4.2.1.1 Emergency Kits and Portable Survey Instrumentation

The auditors reviewed Emergency Plan Section 12 and Appendix B and Procedure OP 3506. The auditors also interviewed the Plant Emergency Plan Coordinator who was responsible for this area.

The licensee had dedicated emergency equipment and supplies at the outer gate guardhouse, EOF, alternate EOF, inner gatehouse, main control room, and technical support center. At the operational support center, the licensee would rely on routine supplies at the HP control point for emergency use. All equipment and supplies were located as specified in OP 3506. A check of instruments found them to be operable with current calibration stickers. Instruments were maintained, operability checked, and calibrated as discussed in Section 5.5.1.

The licensee had the appropriate instrumentation for emergency environmental surveys. However, the auditors noted that there were no backup instruments for the offsite monitoring teams.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following matter should be considered for improvement:

- Provide backup instruments at the EOF for the offsite monitoring teams. (50-271/82-05-29)

4.2.1.2 Area and Process Radiation Monitors

The auditors reviewed Emergency Plan Section 6, procedures OP 2135, OP 2136, OP 2137, and OP 3122, and interviewed licensee personnel responsible for this area.

The licensee had approximately 30 area monitors, 8 process monitor systems, 2 high-range environmentally qualified containment monitors, and a high-range stack monitor. With the exception of the recently installed high-range containment and stack monitors, these systems had been calibrated and checked in accordance with approved procedures. Calibrations included both multipoint source checks and electronic calibration.

The high-range stack and containment monitors were calibrated following installation during the 1981 refueling outage and will be recalibrated during subsequent refueling outages. Final review and approval of their routine calibration procedures had not been completed as of this appraisal. The licensee stated that these procedures would be in place before the next calibration (currently scheduled for the March 1983 refueling outage).

The licensee's area monitors were typically four decade instruments with a maximum range of either 1 or 10 R/hr. One refueling floor monitor had a range of 1000 R/hr. These would be supplemented by the high-range containment monitors with a maximum range of 10^7 R/hr. A licensee study of in-plant dose rates using the NRC specified accident conditions indicated all except the high-range containment monitor would be offscale. It further showed dose rates sufficiently high to preclude access to the reactor building for some time (over two weeks) following an accident. Licensee personnel stated they had capability to determine building accessibility using containment monitoring, possibly available area monitors, and extrapolation from in-plant surveys.

Based on the above findings, this portion of the licensee's program appears adequate, however, the following matter should be considered for improvement:

- Ensure that adequate procedures for calibration of the high-range stack and containment monitors are in place prior to the next scheduled calibration. (50-271/82-05-30)

4.2.1.3 Nonradiation Process Monitors

The auditors reviewed Emergency Plan Section 6, Appendix A, Procedure AP 3125, inspected the Control Room, and interviewed Control Room operators.

The process monitors relied on for accident identification, as specified in the Emergency Plan Appendix A, "Emergency Action Levels," were noted to be in the Control Room, of the required range, and observable. The earthquake monitor (accelerograph) was located in the switchroom and required subsequent offsite analysis to determine earthquake magnitude. An indicator light showed instrument activation. Certain other parameters (notably river level and other natural phenomenon) required visual assessment. No problems were noted with this procedure.

Based on the above findings, this portion of the licensee's program appeared adequate.

4.2.1.4 Meteorological Instrumentation

The licensee provided brief outlines of the meteorological measurements and dose assessment capabilities in the Emergency Plan. The evaluation of the dose assessment capability is found in Section 5.4.2 of this report.

The auditors reviewed the meteorological measurements preventative maintainance and data reduction programs. The auditors determined that the licensee's meteorological capabilities address the requirements of NUREG-0737, TAP III A.2 and the criteria set forth in Appendix 2 to NUREG-0654, Revision 1, in adopting the interim compensating measures to Milestone 3.

The meteorological instrumentation provided the basic parameters (i.e., wind direction and speed and an estimation of atmospheric stability) necessary to perform the dose assessment. Data from the primary and backup systems were available on digital and analog displays, respectively, in the Control Room. The backup system delta-T (stability estimator) was recorded on a strip chart that would not permit the user to differentiate amongst stability classes. These data are readily available to the TSC and EOF via the Control Room and by alternate means via dial-up.

All measurement systems appeared to be in operation and were recently calibrated. The licensee's preventative maintenance program consisted of a multi-tiered, graded set of checks, surveillance, and calibration activities that provided reasonable assurance that meteorological data would be available for use. Calibrations were performed by an external organization following plant procedures (OP 5335, 5336, 5337, and 5343), monthly surveillances and daily checks are performed by plant staff. The data were reviewed by Yankee Atomic meteorologists on a daily basis.

The primary system was located in an area of relatively flat terrain that was generally free of obstacles. However, in the immediate vicinity of the tower, trees in the axis of the river valley may influence data values at the lower measurement height. Similar exposure deficiencies exist at the backup system location; to minimize this influence, the licensee raised the measurement height. The licensee should resolve the equipment exposure deficiencies

so that recommendations regarding protective measures accommodate the uncertainties in the data.

Additional provisions for access to alternate data sources have been made with the National Weather Service (NWS). Information regarding severe weather conditions that may impact the site was provided by the dispatcher. The dispatcher had the NOAA Weather Wire and access to an alternate source of NWS data.

Direct telephone access by the NRC staff to individuals responsible for performing the dose assessment function could be accomplished by using the NRC Health Physics Network.

The long-term measures that replace the interim compensating measures should consider the influence of the valley terrain environment on the spatial distribution of material (likely trajectory) as well as the temporal changes in meteorological conditions.

Based on the above findings, improvement in the following area is required to achieve an acceptable program:

- Resolve the problems with the the meteorological sensor resulting from the foliage growth in the vicinity of the measurements system. (50-271/82-05-31)

In addition to the above finding, the following matter should be considered for improvement.

- Improve the display of the temperature difference parameter in the Control Room. The size and scale of the recorder was insufficient to determine differences in stability class. (50-271/82-05-32)

4.2.2 Protective Equipment

4.2.2.1 Respiratory Protection

The auditors reviewed procedures OP 3507, AP 0505, and Section 10 of the Emergency Plan. In addition, the auditors interviewed licensee personnel responsible for administering the respiratory protection program and maintaining the equipment. The auditors also inspected the equipment.

The auditors observed 21 self-contained breathing apparatus (SCBA). These consisted of 13 utilizing compressed air with a rated 30-minute working duration and 8 utilizing compressed oxygen with a 60-minute rated duration. Five extra air bottles and 43 extra oxygen bottles were noted. This would approximate 60 man-hours worth of SCBA protection and appeared adequate for initial emergency response. Air quality checks have been performed quarterly for air bottles and annually for the service air to assure breathing air meets Grade D (or better) quality.

Filter canister respirators were also available in the emergency kits and appeared adequate in quantity and condition. It was noted that filter canisters included both approved particulate and unapproved charcoal-particulate types.

The licensee did not have onsite refill capability, but had made arrangements with the Brattleboro Fire Department to refill air bottles during accident situations. Refill of oxygen bottles could not be accomplished quickly, which is why a substantial number of reserve bottles had been procured.

The licensee had air-line supplied respirators and air suits, but indicated these would not be used for initial emergency response due to lack of radiation monitoring on the service air compressors.

Based on the above findings, this portion of the licensee's program appears to be adequate.

4.2.2.2 Protective Clothing

The auditors reviewed Emergency Plan Section 10 and procedure OP 3507. In addition, three members of the health physics staff, who would implement these procedures, were interviewed. Plant inventories of protective clothing were inspected at the OSC and in the various emergency kits.

The normal supplies of protective clothing were maintained at the access control area which was part of the OSC. While these items were not specifically reserved for emergency use, they would be readily available for in-plant access during emergencies. Additional supplies were reportedly stored in the south warehouse but were not inspected by the auditors. Emergency kits at the designated plant facilities contained adequate protective clothing for initial response. By licensee estimate, approximately 2,000 cloth overalls were available onsite and also a comparable amount of paper and plastic clothing. The Plant Health Physics Supervisor indicated additional clothing could be readily obtained from the Yankee Rowe plant (approximately 20 miles) or from various Brattleboro supply houses on a relatively short notice.

Based on the above findings, this portion of the licensee's program appeared to be adequate.

4.2.3 Emergency Communications Equipment

The auditors reviewed Emergency Plan Section 7 and procedures OP 3500, OP 3501 and OP 3503. The auditors also interviewed licensee personnel who would implement these procedures.

The communications equipment for onsite use was located as stated in the Emergency Plan and Procedures. Alarms having specific meanings and instructions were also given over the plant's PA system. The appropriate communications were provided at the emergency centers and with offsite agencies. This included

the Nuclear Alert System (NAS) which ties the site with the plume EPZ States. Several telephones, plant intercom, plant radio net and microwave system were connected to emergency or redundant power.

During the emergency exercise on February 18, 1982, the licensee used the plant paging system, channel 4 as the main communication line among the CR, TSC, EOF and OSC. A dedicated system (telephone) would be more efficient. Also the testing of the beeper system at the beginning of 1982 resulted in approximately one-half of the personnel not being contacted.

As discussed in Section 7.2 several members of the Control Room staff indicated to the auditors that the location of the Control Room emergency communications equipment (in front of the main board) would interfere with their response during an emergency.

Based on the above findings, this portion of the licensee's program appears to be acceptable, but the following matters should be considered for improvement:

- Provide for a dedicated system of communications among the CR, TSC, EOF and OSC. (50-271/82-05-33)

- Ensure that action will be completed on the pager system to correct deficiencies identified during back-shift tests. (50-271/82-05-34)

- Relocate the emergency communication equipment in the Control Room such that it will not interfere with Control Room immediate actions. (50-271/82-05-35)

4.2.3.1 Public Alerting and Notification System

Emergency Plan Appendix G stated that it would contain a description of the public notification system but did not contain the information at the time of the appraisal. As discussed in Confirmation of Action Letter No. 82-09, deficiencies have been identified during initial installation and testing of the Prompt Notification System and that these deficiencies will be corrected by June 1, 1982.

Based on the above finding, this portion of the licensee's program appeared to be adequate.

4.2.4 Damage Control/Corrective Action, Maintenance Equipment and Supplies and
4.2.5 Reserve Emergency Supplies and Equipment

The auditors found no sections in the Emergency Plan or Procedures which specifically addressed these items. The auditors noted the licensee did not have dedicated reserves of maintenance equipment for emergency activities. Routinely used equipment was considered to be sufficient to provide for initial

emergency needs with reserve material available from the stock room. Replacement parts such as valves, gaskets, tools, as well as protective clothing, etc. have been subject to computerized inventory control.

Reserves of certain dedicated radiation protection equipment have been provided for emergency use by including them in the emergency kits located at the Control Room, TSC, EOF, and alternate EOF. (See Section 4.2.1.1 for further discussion of emergency kits.) In addition, the normal complement of radiation protection equipment would be available at the health physics control point in the OSC.

Additional supplies could be made on relatively short notice from other plants as part of the Yankee Mutual Assistance Plan.

Based on the above findings, this portion of the licensee's program appeared adequate.

4.2.6 Transportation

The auditors reviewed Emergency Plan Section 10 and Procedures OP 3504, OP 3510 and OP 3524. The auditors interviewed licensee and contractor personnel who would implement these procedures.

The auditors found that the licensee had five standby emergency vehicles. Security had responsibility for moving the vehicles to the bus parking lot by the EOF. Two sets of keys were controlled by Security for these vehicles. In addition to company vehicles, employee vehicles are relied upon for transporting emergency monitoring teams offsite.

Ambulance service would be provided by an offsite supporting agency.

Based on the above findings, this portion of the licensee's program appears to be adequate.

5.0 EMERGENCY IMPLEMENTATION PROCEDURES

5.1 General Content and Format

The auditors reviewed all the procedures associated with the implementation of the Emergency Plan.

The procedures clearly specified the individual responsible for their implementation. However, as discussed in Sections 7.2, 5.3 and 5.4.2 of this report, the procedures used to implement the site response to Site-Area and General Emergencies did not provide a basis on which to recommend protective action offsite.

The procedures were organized in a step-by-step sequential fashion with a check-off provided for each step where appropriate. The procedures contained purpose, reference, discussion, precaution and prerequisite sections. The auditors found that the procedures referenced were appropriate. The purpose and discussion sections provided overview information on the use of the procedure and its basis. The precaution and prerequisite sections contained some information on actions to be taken before the procedure was to be implemented. However, the precaution sections did not appear to provide sufficient discussion on the need for radiation protection during implementation of some procedures. In particular, it was noted during the post-accident sampling walk-through (see Section 7.2 of this report) that there were no caution statements at appropriate steps in the procedure. This could result in unnecessary exposure.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following matter should be considered for improvement:

- Review the emergency procedures to ensure that they contain sufficient precautions and caution statements. (50-271/82-05-36)

5.2 Emergency, Alarm and Abnormal Occurrence Procedures

The auditors reviewed the procedures used by Control Room to respond to alarms and abnormal occurrences to include OP 3109, 3020, OP 3116, OP 3117, OP 3122 and OP 3124.

The auditors found that several of the procedures instructed the staff to declare various emergencies directly without referring to the classification procedure AP 3125. These procedures also instructed the staff, as part of the subsequent actions, to refer to the classification procedure (AP 3125) and revise the emergency classification as appropriate.

However, the auditors found that many procedures such as OP 3117, OP 3122 and OP 3124 refer to emergency classes such as "local emergency" or procedures such as OP 3001 now eliminated or renumbered. Plant personnel were aware of this problem and the relationship of these old emergency classes and procedures to the current ones.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following areas should be considered for improvement:

- Review the Control Room emergency alarm, abnormal occurrence procedures to ensure that all references to other procedures are correct. (50-271/82-05-37)

- Review the Control Room emergency alarm, abnormal occurrence procedures to identify those procedures where direct event classification can be made and to ensure that the direct classifications are correct. (50-271/82-05-38)

5.3 Implementing Instructions

The auditors reviewed procedures OP 3500, OP 3501, OP 3502 and OP 3503. The auditors also interviewed and walked-through the use of these procedures with Control Room personnel.

Procedures OP 3500-OP 3503 specified, for each class of emergency, the specific actions to be taken by the: Shift Supervisor/Plant Emergency Director, Security Shift Supervisor, TSC Coordinator, EOF Coordinator, OSC Coordinator, Recovery Manager, and all of the tag board assignments such as monitoring teams and rescue personnel.

The procedures were in a step-by-step format with check-offs provided for each appropriate step. The steps in the procedures orchestrated initial notifications, activation of the emergency organization, offsite recommendations, requests for offsite assistance, TSC/EOF/OSC activation, out-of-plant surveys, communications, onsite assistance/rescue, radiological habitability assessment, and recovery operations. The criteria for declaration of emergencies are discussed in Section 5.3.1 of this report.

The licensee implementing procedures only provided for recommending sheltering in its initial notification to the State of Vermont for Site Area Emergencies and not to the States of Massachusetts and New Hampshire, also in the plume EPZ. For General Emergencies the initial recommendation to the plume EPZ states included only two protective actions either "no action recommended" or "shelter is recommended." There were no provisions to recommend evacuation. Plant personnel required to use these recommendations were provided with no basis to determine which of the two actions to use in an emergency.

During Control Room walk-throughs (see Section 7.2 of this report), the Control Room staff did not demonstrate the ability to determine which protective action recommendations should be made. The auditors noted that Section 10.2 of the Emergency Plan recommends usage of criteria in the EPA Protective Action Guides for protective action recommendation; however, as discussed in Section 5.4.2 of this report, neither the Plan nor procedures provided a criteria for recommending protective actions based on plant conditions (core, containment). During the EOF walk-through (see Section 7.2 of this report), the auditors noted that an EOF Coordinator and a Radiological Assistant were aware of and used the EPA PAGs in the Plan even though they were not referenced in the procedure.

In addition, as discussed in Section 5.4.2 of this report, the procedures did not contain a criteria to indicate when monitoring should be conducted to determine if there was a need for radioiodine protection. Since the procedures and training did not address the criteria or basis for making protective action decisions, the Control Room staff could not demonstrate an ability to perform these steps during the walk-throughs as discussed in Section 7.2.

Based on the above findings, improvement in the following area is required to achieve an acceptable program:

- Revise the implementing procedures to direct the Emergency Director, Emergency Coordinator or Recovery Manager, as appropriate, to recommend either shelter or evacuation as core conditions or projected doses dictate to all the plume EPZ States (Vermont, New Hampshire and Massachusetts) and provide the criteria for making these recommendations (See Section 5.4.2 of this report). Provide training for those individuals on the criteria for making protective action recommendations relating to offsite consequences and provide offsite officials with an opportunity to review these criteria and their bases. (See NUREG/CR-1131) (50-271/82-05-39)

5.3.1 Emergency Action Levels (EALs)

The auditors reviewed Emergency Plan Appendix A and Procedure AP 3125. In addition, the auditors interviewed personnel who were responsible for the development and use of the EALs to include the Operations Superintendent and Control Room personnel.

The auditors found that some of the EALs contained in the classification procedure (AP 3125) were not consistent with those in the Emergency Plan. As discussed in Section 7.2 of this report, Control Room personnel had problems correctly classifying events for which specific levels or trends were not specified in the classification procedure. The Control Room personnel proceeded across the classification chart until they came to an EAL that was not in terms of indicators observable in the Control Room (e.g., loss of two of three fission product barriers) and then classified the event at the highest level for which there were a set of measurable observable indicators.

In addition, some of the events were incorrectly classified because the EAL in the procedure was misinterpreted due to simplification of the EAL from the Emergency Plan (e.g., loss of physical control of the plant).

The classification procedure with its organization (not having a separate list of EALs for each NUREG-0654 example initiating condition) allowed for prompt classification of events, except for the events where the measurable/observable indicators from the Emergency Plan were not used. Therefore, the classification procedure should be revised to provide measurable indicators for all emergency classes.

The auditors reviewed the Emergency Plan EALs and found many deficiencies such as: some NUREG-0654 example initiating conditions were not addressed in the procedure or Plan; some examples of initiating conditions were not classified in the procedure and Plan at a level consistent with the guidance; and a few initiating conditions were only addressed in the procedure.

In addition, it appared that revisions were required to the Emergency Plan EALs to adequately address the guidance of NUREG-0654, Appendix 1.

Based on the above findings, improvement in the following area is required to achieve an acceptable program:

- Revise the procedure containing Emergency Action Levels (EALs) to address the requirements of NUREG-0654, Appendix 1. Train the Control Room staff and other appropriate individuals on the revised procedure. (50-271/82-05-40)

5.4 Implementing Procedures

5.4.1 Notifications

The auditors reviewed emergency procedures OP 3500, OP 3501, OP 3502, OP 3503, and OP 3504. The auditors also interviewed the licensee personnel who would implement notifications in accordance with these procedures to include personnel qualified as Emergency Directors, security personnel and personnel on the plant page system.

Procedures OP 3500-OP 3503 specified for each emergency class the steps for notification and/or activating onsite personnel; the States of Vermont, New Hampshire, and Massachusetts; Yankee NSD support personnel; fire; medical; law enforcement; NRC and plant management. The Control Room directs the Security Shift Supervisor to activate the telephone page systems for NSD and plant management. Plant management personnel are paged and directed to call the plant (all calls go to security during the backshift) for instructions. The Shift Supervisor instructs security on what message to give to incoming callers. Notification to the States and NRC would be made directly from the Control Room using predetermined message formats.

The communication procedure (OP 3504) included the phone numbers used to contact fire and rescue support as backups to the page system. However, this procedure was not referenced in the appropriate steps of the implementing procedures.

The auditors also found that the Control Room staff had posted key numbers, such as fire assistance, for ready reference.

The auditors spot-checked the phone numbers and found them to be correct. The State authenticated the notifications by calling the Control Room back.

There was no procedure for calling in offduty working level personnel qualified to augment the onsite organization during the backshift. The system in use relied on the paged managers to call those members of their groups they felt would be required. Under this system, if a manager was not contacted, none of the members of his/her staff would be contacted until personnel at the EOF realized that no one from the functional area had responded. This would occur after the EOF was manned resulting in possibly a considerable delay in manning key functional areas. Discussions with plant management indicated they were aware of this problem and the need to develop a call-in procedure that assures that all key functional areas are notified.

Based on the above findings, improvements in the following area is required to achieve an acceptable program:

- Provide a backshift call-in documented method for notifying all appropriate emergency organization personnel down to the working level. (50-271/82-05-41)

In addition to the above findings, the following matter should be considered for improvement:

- Reference the procedure containing the emergency phone numbers or provide the appropriate numbers at the steps in the implementing procedures requiring their use. (50-271/82-05-42)

5.4.2 Assessment Actions

The auditors reviewed Emergency Plan Section 10 and Appendix C and Procedures OP 3513, OP 3500-3503, OP 3525, OP 3530, OP 3509, and AP 3125. The auditors also interviewed licensee personnel to include the Emergency Planning Coordinator. In addition, walk-throughs using these procedures were conducted and are detailed in Section 7.2 of this report.

The auditors noted there was no overall procedure which covers the implementation of the accident assessment scheme. Procedure AP 3125 outlined methods for accident classification based on plant conditions, while OP 3500 through OP 3503 outlined the actions required of plant personnel, visitors and contractors during the four emergency classes. Procedure OP 3513 was a step-by-step procedure used to evaluate projected offsite whole-body dose rate based on stack release rate, and to estimate downwind whole-body and thyroid doses

based on field measurements and current meteorology. A nomogram was used to estimate the site boundary whole-body dose rate knowing time after shutdown, current windspeed, high-range stack gas monitor reading, and stack flow. In addition, the licensee had a field sample thyroid dose nomogram for estimating thyroid dose based on sampling results of the offsite monitoring teams. Knowing dose rates and radioiodine concentrations at one offsite location, the licensee had a program on a TI-59 calculator which rapidly calculated dose rates and radioiodine concentrations at plume centerline locations. Walk-throughs of dose calculations in the Control Room indicated plant personnel need more training in OP 3513 (see Sections 3.2 and 7.2.1 of this report).

The licensee had no provisions in their procedures for initially estimating thyroid dose or dose rate based on plant conditions. A trigger level (e.g., certain high-level stack monitor readings) needs to be developed to indicate the possibility of a radioiodine problem and therefore the need for pulling a silver zeolite cartridge at the stack. The radioiodine concentration going out the stack can then be determined and converted to an offsite dose rate using current meteorology. In addition, the licensee had no provisions in their procedures for making initial dose projections if installed Control Room instrumentation (e.g., high-level stack monitor) was inoperable. This could be handled by making procedural changes to indicate that a security team would be sent to the site boundary to obtain a whole-body dose rate reading and that a silver zeolite cartridge will be collected from the main stack for the thyroid dose determination.

The procedures did not provide or reference a criteria on which to base protective action recommendations to be made to offsite officials. The EPA PAGs were in the Emergency Plan but they were not referenced; and, there were no criteria based on core conditions on which to base protective action recommendations (e.g., potential core melt or core melt in progress).

The licensee had no provisions for relating high-range containment readings to core conditions (i.e., gap release, core melt). Interpretation of this relationship would be valuable to Control Room personnel in determining the extent of core damage and therefore event classification and protective actions to be recommended offsite.

Procedure OP 3509 provided information on the licensee's offsite environmental surveillance program which would be useful during an emergency.

Based on the above findings, improvements in the following areas are required to achieve an adequate program:

- Revise the assessment procedures to include a method for initially estimating thyroid dose rate when plant conditions indicate that an offsite problem may exist (this should include the criteria to indicate when to perform this function); (50-271/82-05-43)

- Provide a method for making initial dose projections if installed Control Room instrumentation is inoperable. (50-271/82-05-44)

- Provide a criteria for recommending protective actions that based on core conditions. (50-271/82-05-45)

- Provide Control Room personnel with the relationship of high-range containment readings to core conditions (i.e., gap release, core melt). (50-271/82-05-46)

5.4.2.1 Offsite Radiological Surveys
and
5.4.2.2 Onsite (out-of-plant) Radiological Surveys

The auditors reviewed Emergency Plan Section 6 and Procedures OP 3510 and OP 3509. The auditors also interviewed licensee personnel who developed and would implement these procedures to include the Emergency Planning Coordinator, several individuals trained as Radiological Assistants, and offsite monitoring personnel. In addition, walk-throughs using these procedures were conducted and are detailed in Section 7.2 of this report.

The licensee's procedure OP 3510 specified methods and equipment to be used to perform emergency offsite radiological surveys including predetermined sample locations. The procedure was written in a step-by-step format which can be easily followed by offsite and site boundary monitoring teams (see Section 7.2 of this report). In addition, the procedure provided space for recording pertinent survey and sampling information. Following sample collection, there were provisions for labeling samples (charcoal cartridges and particulate filters) for future identification. Upon returning to the EOF, the teams would deliver samples to the Radiological Coordinator for further analysis and return completed data sheets to the Radiological Assistant.

Procedure OP 3510, provided for the dispatch of three monitoring teams from the EOF - two offsite teams and one site boundary team. Security personnel at the inner Gatehouse had the appropriate equipment and had been trained to survey and sample at the site boundary. Security personnel could be dispatched at the request of the Control Room during the early stages of an accident before the EOF would be activated (See Section 5.4.2 of this report).

The auditors noted that procedure OP 3510, did not contain any instructions on where or how to obtain a vehicle prior to conducting a survey. In addition, the procedure did not contain any instructions to locate the plume (GM open -closed window). The offsite monitoring teams had been trained to find a location outside the plume to purge the charcoal cartridges. A discussion of this method along with recommended improvements is found in Section 5.4.2.3 of this report.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following matters should be considered for improvement:

- Provide information in the offsite monitoring procedure for obtaining a vehicle for use during site boundary and offsite monitoring. (50-271/82-05-47)

- Provide instructions in the offsite monitoring procedure for determining when the monitoring team is located in the plume (GM open - closed window). (50-271/82-05-48)

5.4.2.3 In-Plant Radiological Surveys

The auditors reviewed Emergency Plan Section 10, and Procedures OP 3507, OP 4530, OP 4531 and OP 4533. In addition discussions were held with the plant Chemist and Health Physics Supervisor, and two chemistry and health physics assistants.

None of the procedures reviewed specifically addressed in-plant radiological surveys under post-accident conditions, although OP 3507 provided some general guidance. Licensee personnel indicated that normal procedures (OP 4530, OP 4531 and OP 4533) would be used for dose rate, contamination, and air sampling, respectively. These normal procedures did not provide radiation protection precautions (e.g., dosimetry, protective clothing, SCBA respiratory protection, initial check with the Control Room for area monitor readings, KI administration, use of extendible probe high-range survey instruments, etc.) appropriate for possible post-accident conditions. Licensee personnel who would perform such surveys were identified as senior health physics personnel, knowledgeable in appropriate radiation protection precautions. Interviews with two such people appeared to confirm this with one notable exception: one Chem & HP assistant indicated he would use a charcoal canister filtered air respirator rather than a SCBA for all but the most severe airborne conditions. Initial in-plant surveys for any major in-plant releases should probably be performed using using the highest protection factor respiratory protection equipment available (i.e., SCBA). The development and use of a simple checklist of items to be considered prior to dispatch of an in-plant survey team might provide the assurance needed that adequate radiation protection precautions would be considered.

Performance of radiological habitability assessments at the TSC, OSC, EOF, and other areas as requested is identified in Appendix VI to the alert, site area, and general emergency implementing instructions. Since the Control Room lacks constant air monitoring and direct radiation area monitoring, it too should be included in the list of areas requiring habitability assessment.

Procedure OP 3507 included adequate emergency dosimetry methods for survey teams, however, reliance has been placed on recall of personnel at 4 rem or time keeping combined with dose rate monitoring for higher doses. For situations where tasks requiring doses greater than 4 rem would be possible, more effective monitoring might be provided through high range (e.g., 0-25R, 0-100R) dosimeters.

The licensee's method for post-accident in-plant iodine monitoring utilized charcoal cartridges. Habitability air sampling at the Control Room, OSC and TSC would involve initial counting of samples using a thin window GM tube and a count rate meter. Licensee personnel indicated subsequent counting would then be performed in the counting laboratory using a high resolution germanium-lithium Ge(Li) detector. Purging of charcoal cartridges with clean air or nitrogen had been studied by the licensee with results indicating that for relatively low air concentrations of noble gas, 95% of the noble gases could be purged using a three minute, 10 lpm purge. A licensee memo dated February 3, 1982, documented this study and instructed that this technique be incorporated into the next revision of post-accident sampling procedures.

The licensee had about 20 silver zeolite cartridges in a post-accident effluent sampling kit. No reference to the use of these for offsite, site boundary, or in-plant habitability surveys was made in the air sampling procedures or the Emergency Plan.

The above in-plant iodine monitoring practice appears workable, but certain additional improvements should be included in the procedure. These are as follows:

(1) Establish a trigger level for gross counting with the GM detector, beyond which samples must be purged and counted using a high resolution Ge(Li) system. This would eliminate the need to count all air samples on the Ge(Li) system, possibly freeing personnel to concentrate on more pressing emergency duties.

(2) Establish criteria for use of silver zeolite cartridges in place of or for supplemental air samples, for in-plant, site boundary and offsite surveys;

(3) For offsite surveys, establish criteria for expedited return and counting of charcoal cartridges on high resolution equipment or use silver zeolite cartridges. (This item supplements discussion in Section 5.4.2.1).

(4) Establish a source for obtaining additional silver zeolite cartridges to supplement the licensee's onsite supply.

Based on the above findings, improvements in the following area are required to achieve an adequate program:

- Provide new procedures or revise existing ones to include methods to distinguish radioiodine from noble gases for in-plant, site boundary and offsite radiological air sampling. Such procedures should include trigger levels for purging and counting of charcoal cartridges on a high resolution system and for alternate use of silver zeolite cartridges. (50-271/82-05-49)

In addition to the above finding, the following matters should be considered for improvement:

- Develop a single checklist of radiation protection concerns and precautions for in-plant survey teams under post-accident conditions. Such a checklist could be appended to an existing procedure or issued as a new in-plant survey procedure. (50-271/82-05-50)

- Provide high range (0-25R, 0-100R) pocket dosimeters for special monitoring situations. (50-271/82-05-51)

- Establish provisions for rapidly supplementing the onsite supply of silver zeolite cartridges. (50-271/82-05-52)

- Add the Control Room to the list of areas requiring radiological habitability assessment contained in Appendix VI to procedures OP 3501, 3502, and 3503. (50-271/82-05-53)

5.4.2.4 Post- Accident Primary Coolant Sampling

5.4.2.5 Post-Accident Primary Coolant Analysis

5.4.2.6 Post-Accident Containment Air Sampling

5.4.2.7 Post-Accident Containment Air Sample Analysis

5.4.2.8 Post-Accident Gaseous and Particulate Effluent Sampling

5.4.2.9 Post-Accident Gaseous and Particulate Effluent Sample Analysis

NUREG-0737 specifies that licensees should be able to perform post-accident sampling and analysis within three hours under accident conditions. The auditors reviewed procedure OP 3530, "Post-Accident Sampling, Rev. 2," that outlined the special procedural steps necessary to handle samples during post-accident conditions. Walk-throughs using OP 3530 were conducted and are detailed in Sections 7.2.5 and 7.2.6 of this report. In addition the following routine analysis procedures that were referenced in OP 3530 were reviewed: (1) OP 2611, Rev. 9, "Gaseous Radwaste; (2) OP 0630, Rev. 4, "Water Chemistry;" and (3) OP 2630, Rev. 4, "Analytical Instrumentation."

Procedure OP 3530 was subdivided according to the various types of post-accident samples. These sections included:

I. Stack Iodine, Particulate and Gas Sampling

   A. Routine Location (if dose rate permits)
   B. High Dose Rate Post-Accident Iodine/Particulate Sampling Using Silver Zeolite
   C. High Dose Rate Gas Sampling

II. Reactor Coolant Sampling and Analysis

A. Routine Location (if dose rate permits)
B. Liquid Post-Accident Sampling

III. Primary Containment Sampling

IV. In-Plant Air Sampling and Analysis with MCA Inoperable (this area was discussed in Section 5.4.2.3 of this report).

V. Noble Gas Release Rate Determination with Off-scale Stack Gas Monitor

VI. Counting Techniques for Highly Radioactive Samples

These sections were preceded by a Precaution Section and did provide limited means to reduce personnel exposure. However, a table of contents and a listing of special equipment to be used for the various samples was not provided. For example the type of syringe to use for the various samples was not specified and caused some confusion during the walk-through.

Concerning the procedural steps for all types of samples, adequate guidance was given to describe the methods for sampling, purging, diluting and transporting the samples to the laboratory. However, as discussed in Section 4.1.1.5, a better shield for transporting the diluted reactor coolant samples should have been provided. In addition, criteria for deciding when to use the routine sample location for the stack and reactor coolant samples rather than the high dose rate sample panels was not included. The auditors also identified that a warning statement concerning preventing a reactor coolant sample from flashing was written as a Note rather than a Caution Statement.

The chemical analyses for the reactor coolant and containment samples were also discussed in OP 3530 with reference to DP 2630 for operation of the analytical instrumentation. The procedure discussed the methods for chloride analysis, boron analysis, and the H_2 and O_2 analyses. Instructions to perform conductivity measurements were described in DP 2630. However, no reference to perform this analysis was provided in OP 3530. Data sheets for the dissolved gas sample were included in OP 3530; but no data sheet for the liquid sample to track the various dilutions was provided. Instrument printouts for the boron and chloride analysis would function as the data sheets for these analyses. Although there were provisions to report results to the Emergency Coordinator, provisions were not specified for returning all original data sheets to the Emergency Coordinator.

For counting high-level isotopic samples (e.g., silver zeolite cartridges and reactor coolant liquid samples) some guidance concerning using the multichannel analyzer (MCA) and Ge(Li) detector at extended distances was discussed. In addition a formula for calculating sample activity at extended distances from the detector was included. Another area discussed in OP 3530 offered an alternative method for counting the samples if the MCA was not available. This method used a portable instrument and the specific gamma ray constant to

calculate the sample activity. The auditors asked a number of chem/health physics technicians if they would know how to use the provided equations and were informed that training was not provided in this area. In addition inherent limitations with this method were not discussed (See Section 3.2 of this report).

The auditors noted that the alternate counting facilities were not specified in OP 3530 and action steps to report the stack effluent samples results to the Emergency Coordintor or Radiological Assistants were not provided. In addition the results from iodine activity analysis of the containment and stack sample were not incorporated into the EALs (See Section 5.3.1 of this report).

Based on the above findings, this portion of the licensee's program appears to be acceptable, but the following matters should be considered for improvement:

Revise Procedure OP 3530 "Post-Accident Sampling" to include the following items:

- table of Contents and Listing of Equipment;

- precautions concerning expected dose rate using NUREG-0737 source terms;

- data sheets and provisions for reporting and returning all original data sheets to the appropriate emergency organizational elements; and

- reference to procedure DP 2630 to perform conductivity measurements on post-accident reactor coolant samples. (50-271/82-05-54)

5.4.2.10 Liquid Effluent Sampling
and
5.4.2.11 Liquid Effluent Sample Analysis

The auditors interviewed licensee personnel who were responsible for these areas and noted that there were no procedures that specifically addressed high-activity liquid effluent sampling and analysis. The licensee had available a station procedure, OP 2610, Revision 8, "Liquid Waste Disposal" that was used routinely to sample and analyze liquid waste. However, no special provisions concerning radiation protection precautions, counting high-activity samples, or transferring previously stored lower level liquid waste were addressed.

Based on the above findings, this portion of the licensee's program appears to be acceptable, but the following matters should be considered for improvement:

- (See Section 4.1.1.8 of this report.)

5.4.2.12 Radiological and Environmental Monitoring Programs

The auditors reviewed Emergency Plan Section 8 and Procedure OP 3509, and also interviewed licensee personnel who would implement the procedures for the radiological and environmental monitoring program (REMP). The Radiological Coordinator was specified in the plan as being responsible for implementing the program and interfacing with the affected State representatives at the EOF as well as the Nuclear Division Services designated support/recovery group.

The auditors noted procedure OP 3509 described the nine station environmental locations which contained continuous air samples and TLDs. The procedure did not address the locations of 32 other TLD locations in the environs, nor assignment of duties for collection of lake water, tap water, soil, vegetation and milk samples. Discussions with the licensee indicated that this part of the REMP was described in the routine Yankee Environmental Laboratory procedures. However, no reference to these procedures was identified in procedure OP 3509.

The auditors determined that adequate provisions existed to analyze collected samples. A mobile van could provide gamma spectrometry and TLD processing capabilities within two hours (See Section 4.1.1.9 of this report). Additional (as well as all final) analyses would be performed at the Yankee Environmental Laboratory.

Based on the above findings, this portion of the licensee's program appears to be acceptable, but the following matter should be considered for improvement:

- Address the assignment of duties for REMP samples to be collected during an emergency, and reference applicable Environmental Laboratory procedures in station procedure OP 3509. (50-271/82-05-55)

5.4.3 Protective Actions

5.4.3.1 Radiation Protection During Emergencies

The auditors reviewed Emergency Plan Section 10 and procedure OP 3507, The auditors also interviewed the Radiological Assistant who would be responsible to develop an emergency radiation protection program for plant staff personnel.

Areas addressed in the procedure included: personnel dosimetry, exposure records, access control for personnel search and/or rescue and repair teams, habitability for emergency response centers, individual dose assessment, and criteria for limiting personnel exposure.

Radiation protection procedures for preventing re-exposure of individuals and guidance for conducting in-plant emergency surveys were not included (see Section 5.4.2.3 of this report).

The Radiological Assistant who was responsible for radiation protection would advise the Emergency Director (TSC Coordinator or EOF Coordinator) concerning when to distribute potassium iodine (KI) to emergency workers. Procedure

OP 3507, Table II, provided that SAM-II or RM-14 results would verify iodine activity and would be used to signal possible distribution of KI to emergency workers. However, no numerical values for these instruments were provided. During the Control Room walk-through (see Section 7.2.1 of this report) some confusion was observed concerning when to distribute KI and who had the authority and responsibility for thyroid blocking protective action.

Based on the above findings, this portion of the licensee's program appears to be acceptable, but the following matter should be considered for improvement:

- Establish criteria for distribution of potassium iodine for thyroid blocking. (50-271/82-05-56)

5.4.3.2 Evacuation of Owner Controlled Areas

The auditors reviewed Emergency Plan Sections 5 and 6 and Procedures OP 3502, OP 3503, OP 3504 and OP 3524.

The procedures specified action levels that required evacuation of the site. The Governor Hunt House Information Center would be used for the assembly areas. There were predetermined PA announcements for each classification of emergency which describe actions to be taken by nonessential personnel.

Reference was made to accountability, personnel monitoring/decontamination procedures at the assembly location.

The auditors noted that there were no specific provisions for immediate evacuation to a predetermined location out of the immediate plant area if conditions warranted such actions. In addition, no provisions were made to direct augmentation personnel to a reassembly location out of the area before reentry, if conditions warranted.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following matter should be considered for improvement:

- Develop a procedure for immediate evacuation to a predetermined locaton and to provide a reassembly area to be used by personnel reporting to the site if conditions warrant. This should include a revision to the call-up procedures to allow directing offduty augmentation personnel to this location. (50-271/82-05-57)

5.4.3.3 Personnel Accountability

The auditors reviewed Emergency Plan Sections 5 and 10 and procedures OP 3501, OP 3502, OP 3503 and OP 3524. The Emergency Plan and procedures described the positions in the emergency organization responsible for directing and obtaining an accountability of individuals at each emergency center and the individuals that were evacuated from the site protected area. The licensee's Emergency Plan exercise conducted on February 18, 1982, showed that accountability results had been obtained in approximately 30 minutes from declaration of the

emergency. The procedures specified the position in the emergency organization to whom reports of accountability were made and referenced search and rescue procedures. After initial accountability was obtained, there were provisions to maintain accountability of all individuals authorized to be onsite.

Based on the above findings, this portion of the licensee's program appears to be adequate.

5.4.3.4 Personnel Monitoring and Decontamination

The auditors reviewed Emergency Plan Section 10 and Procedures OP 3507, AP 0506 (Personnel Monitoring) and RP 0520 (Personnel Decontamination Procedure). The auditors also interviewed licensee personnel, who developed these procedures, including a plant health physicist.

The auditors noted the licensee had no emergency procedure for personnel monitoring and decontamination, but relied on their routine procedures (AP 0506 and RP 0520). Procedure RP 0520 provided a sequential list of decontamination methods for various body locations. The Emergency Plan Section 10 indicated all personnel exceeding contamination levels of 2 times background or 2000 net cpm would be held for decontamination.

Procedure RP 0520 did not provide a form for recording pertinent decon survey information (individual's name, contamination level, decon method used, and results of decon). Plant personnel indicated names of individuals with significant contamination would be recorded in a log book. However, the auditors noted that log books were not available at the EOF or alternate EOF. In addition, the auditors noted that the procedure did not specify action levels which would require further assessment (i.e., whole-body counting, urinalysis). The procedure did, however, refer the individual performing the decon to notify the HP supervisor should designated decon methods be ineffective.

The auditors also noted that there was only one survey instrument available for personnel monitoring at the EOF assuming all offsite monitoring teams are dispatched.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following matters should be considered for improvement:

- Provide forms or a log at the EOF and alternate EOF for recording names of contaminated individuals, contamination levels, decon method used and results of the decon. (50-271/82-05-58)

- Establish contamination action levels which would require further assessment (i.e., whole-body counting, urinalysis). (50-271/82-05-59)

- Provide additional survey instruments at the EOF dedicated for personnel monitoring or make provisions for supplementing supplies during an emergency. (50-271/82-05-60)

5.4.3.5 Onsite First Aid/Search and Rescue

The auditors reviewed Emergency Plan Section 10 and Procedure OP 3508 and interviewed licensee staff members.

The procedure addressed methods for response, recovery, transport, handling, and basic treatment guidelines for minor and serious injuries involving possible contamination. Radiation protection guidance for both the victim and treatment personnel were included. The procedures also included criteria for using offsite medical treatment facilities.

The plant had a 6-person medical team trained in advanced first aid methods and cardiopulmonary resuscitation. These individuals were volunteers trained initially by the plant nurse and in addition received one day per month of retraining. The training included a discussion of personnel radiation dose acceptable for lifesaving action. Present licensee criteria was based on the NCRP 39 recommended maximum of 100 rem for lifesaving actions. It was pointed out to the licensee that current regulations stated in 10 CFR 50.47 endorse EPA recommended protective action guides which as stated in EPA 520 are 75 rem. The auditors discussed this point with licensee personnel who indicated the current guidance contained in the emergency plan would be reviewed. In light of this the auditors considered this a minor item. Members of the licensee's medical team, including knowledgeable health physics personnel also stated that receiving 100 rem for lifesaving actions was acceptable to them.

It was noted that the position of plant nurse had been recently vacated. The licensee indicated that contractual arrangements with an ambulance service had been made to provide qualified personnel for continuing the medical team training program until such time as the plant nurse position was refilled.

Based on the above findings, this portion of the licensee's program appeared adequate, but the following matter should be considered for improvement:

- Make the emergency exposure criteria for emergency workers consistent with the EPA Emergency Worker and Lifesaving Activity Protective Action Guides given in EPA-520/1-75-001. (50-271/82-05-61)

5.4.4 Security During Emergencies

The auditors reviewed Emergency Plan Sections 8 and 12 and Procedures OP 3524 and SP 0906. The auditors also interviewed licensee and contractor personnel who developed and who implemented these procedures.

The security measures to be implemented during the four emergency classes were specified in the station emergency and security procedures. In the event of an evacuation, site security would interface with the TSC for in-plant security and would coordinate EOF actions with the EOF Coordinator.

Based on the above findings, this portion of the licensee's program appears to be adequate.

5.4.5 Repair and Corrective Actions

The auditors reviewed Emergency Plan Sections 8 and 10, OP 3507, and held discussions with licensee personnel. A specific procedure for repair or corrective action had not been developed; however, the underlying concepts and philosophy were reflected in both the Plan and OP 3507.

All licensee personnel interviewed on this subject indicated that a pre-task briefing for any repair or corrective actions would be performed. Included in such a briefing would be task performance methods, radiation protection criteria, and any dose limitations.

A Health Physics Technician would accompany such repair crews and provide dose control through methods outlined in OP 3507. As discussed in Section 5.4.2.3, the use of extended range (0-25R, 0-100R) pocket dosimeters might provide better monitoring for high dose accumulation situations by not requiring workers to stop in the middle of a task and have 0-5R dosimeters rezeroed. Maximum dose limits assigned for repair or corrective action work are consistent with appropriate EPA protective action guides.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following item should be considered for improvement:

- Develop a repair/corrective action procedure for use by OSC, TSC, and EOF personnel which would identify items necessary for consideration, planning, and briefing of teams prior to task performance. (50-271/82-05-62)

5.4.6 Recovery

The auditors reviewed Emergency Plan Section 8, the implementing procedures, and interviewed licensee personnel. It was noted that a specific procedure for recovery has not been developed; however, Section 8 of the Plan addresses criteria for entering the recovery phase.

The auditors found the organizational authority for declaring that a recovery phase was to be entered in Section 8.3 of the Emergency Plan. The licensee's site Recovery Manager must notify and reach agreement with the States of Vermont, New Hampshire, and Massachusetts that there was no longer a need for consideration of further public protective action or surveillance related to such protective action. The major responsibilities of the recovery organization (e.g., plant radiological surveillance, access control, clean-up, repair, etc.) were delineated in the Plan.

Based on the above findings, this portion of the licensee's program appears to be adequate.

5.4.7 Public Information

The auditors reviewed Emergency Plan Sections 8 and 11, Procedure AP 0835. the auditors interviewed licensee personnel who developed and would implement the procedures for release of public information.

The Emergency Plan specified the authority, responsibilities and duties of the Director of Communications who would disseminate public information and coordinate information releases among Federal, State and local agencies.

The procedures identified the Federal, State and media organizations involved in news dissemination, their locations, and the means of contacting these organizations.

The licensee had provided residents of the plume EPZ with information regarding action to be take during an emergency to include a sticker to be placed on the telephones. All commercial facilities were furnished with a poster that provided emergency response information; however, the auditors noted only one poster was seen posted in the area. A mailing was made yearly which contained a return card by which additional information could be requested.

Based on the above findings, this portion of the licensee's program appears to be adequate.

5.5 Supplementary Procedures

5.5.1 Inventory, Operational Check and Calibration of Emergency Equipment, Facilities and Supplies

The auditors reviewed Emergency Plan, Appendix B, and Procedure OP 3506 and held interviews with members of the licensee staff.

The Emergency Plan and procedure provided a specific inventory listing of all the equipment reserved for use during emergencies and specified the location of the equipment. The frequency with which emergency equipment was to be inventoried, operationally checked and/or calibrated was specified. Communications equipment, power supplies, batteries, and other equipment were inventoried and operationally checked and calibrated. The responsibilities for the performance of emergency equipment readiness checks and for correcting any noted deficiencies were delineated.

Based on the above findings, this portion of the licensee's program appears to be adequate.

5.5.2 Drills and Exercise

The auditors reviewed Emergency Plan Section 12 and Procedure OP 3505. The auditors also interviewed licensee personnel who would implement this procedure.

The Emergency Plan and procedure specified the drill and exercise schedule for the following:

- Radiation Exercise (Annually to test and evaluate overall emergency preparedness)

- Communication Tests (Monthly with Plume EPZ States and yearly with monitoring teams and State Emergency Operations Centers)

- Fire Drills (Annually)

- Medical Drills (Annually)

- Radiological Monitoring Drills (Annually to evaluate onsite/offsite collection and analysis of airborne sample media)

- Health Physics Drills (Semiannually and included sampling and analysis of liquid airborne samples)

There were no provisions for conducting backshift exercises and there were no provisions for conducting drills of the backshift emergency personnel call-in system (pager/call lists). There were no provisions to test communications with Federal response organizations annually; to test communications with the TSC and EOF annually; to test communications with NRC:Region I and Headquarters monthly in accordance with 10 CFR 50, Appendix E, III.(E).(9).

The procedure provided for documentation of the exercise scenario, comments of observers, PORC review, and corrective actions assignment and completion. The procedure also provided for pre-drill notification of State, Federal and local offsite agencies. The procedure specified that observers' comments would be submitted to the PORC and then assigned to various plant organizations for review.

Based on the above findings, this portion of the licensee's program appears to be acceptable, but the following matters should be considered for improvement:

- Provide for backshift exercises, and for a backshift test of the offduty emergency organization call-in system. (50-271/82-05-63)

- Provide for additional communications test in accordance with 10 CFR 50, Appendix E, III.(E)(9). (50-271/82-05-64)

5.5.3 Review, Revision and Distribution

The auditors reviewed Emergency Plan Section 12 and Procedure 6805. The auditors also interviewed the personnel responsible for distribution of the procedures. The PORC was responsible for the review of changes to the Emergency Plan and procedures to include an annual evaluation of agreements with offsite agencies and annual exercise comments.

The emergency procedures had been reviewed and so noted by PORC. In addition, each procedure had a review date specified. Procedure distribution was also reviewed by PORC.

Based on spot checks it appeared that the procedures and Plan had been distributed in accordance with the approved distribution list.

Based on the above findings, this portion of the licensee's program appears to be adequate.

5.5.4 Audit

The auditors reviewed Emergency Plan Section 12 and Procedures QA-18-2 and AP 6010 and held discussions with licensee staff members. The auditors inspected the audit check lists and results of the 1980 and 1981 audits.

The audits were performed by the Operational Quality Assurance Department of the Yankee Nuclear Services Division. The audit covered inspection of equipment and supplies and training with department heads. Personnel were not interviewed to determine their level of training and drill/exercise correction items were not physically checked to determine if they had been completed. In addition, drills and exercises were not observed as part of the audit process.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following matter should be considered for improvement:

- As part of the audit process, observe drills and exercises, conduct followups to ensure that corrective actions have been actually performed and interview/walk-through personnel to check the adequacy of training. (50-271/82-05-65)

6.0 COORDINATION WITH OFFSITE GROUPS

6.1 Offsite Agencies

The auditors reviewed Emergency Plan Section 8 and Appendix E. In addition, discussions were held with licensee personnel and representatves of offsite agencies who would provide emergency support were interviewed.

The auditors determined that the State agencies, hospital, ambulance, fire, and police had been trained in the Emergency Plan and implementing procedures to the appropriate degree, and had participated in drills and exercises. These groups appeared aware of and willing to provide the support specified in the letters of agreement.

The licensee's plans for accommodating NRC emergency response personnel were reviewed. As noted in Section 4.1.1.2 designated space and communication equipment had not been provided in the TSC for the NRC; however, space did not appear to be a problem. The licensee was given a copy of the current NRC Region I anticipated emergency response for consideration in better establishing NRC interfaces.

The Emergency Plan did not describe the offsite protective action decision making process in sufficient detail to allow for evaluation against the requirements of 10 CFR 50, Appendix E, IV.D.3; 10 CFR 50.47(b)(4) and (10) or the guidance of NUREG-0654, Appendix 3 Section C. The Emergency Plan did not describe the systems and procedures which would be used to transmit protective action recommendations from the licensee to the offsite officials with the authority and responsibility to make sheltering and evacuation decisions, within 15 minutes, on a 24-hour-a-day basis; that these officials had access to the criteria to be used by the licensee in making such recommendations; and that these officials had prompt access to the public alerting and information systems. State and local response plans should call for reliance on information provided by the licensee and that notification decisions can be made within 15 minutes of the time offsite officials are notified that a situation exists requiring urgent action.

In order to correct deficiencies identified in Sections 5.3 and 5.4.2 of this report, the licensee will be developing procedures to recommend both sheltering and evacuation based on the status of the core and plant safety systems in addition to projected doses (EPA PAGs).

Based on the above findings, improvements in the following areas are required to achieve an acceptable program:

- Provide the NRC with a revised Emergency Plan which contains a description of the systems and procedures used to assure that plume EPZ State/local officials have the capability to make a public notification decision within 15 minutes for situations requiring urgent sheltering or evacuation. (50-271/82-05-66)

In addition to the above findings, the following item should be considered for improvement:

- Review the Emergency Plan and procedures to ensure compatibility with the anticipated USNRC Region I response to the site during an emergency. (50-271/82-05-67)

6.2 General Public

The auditors reviewed Emergency Plan Sections 8 and 11, Procedure AP 0835 and the plant public information procedure (not a controlled document). The auditors interviewed licensee personnel who developed and implement the procedures for the release of public information.

As discussed in Section 5.4.7 of this report the licensee had provided persons within the 10 mile EPZ annual with updated information on emergency planning. Businesses had received a poster and a brochure with emergency information and had been requested to post it in their place of business.

Emergency information had also been distributed to the State Chamber of Commerce and National Park Service for posting at appropriate locations within the plume EPZ.

The information included a map showing evacuation routes, a listing of radio stations, a discussion of emergency classes and exercises, and sources of additional information. However, it did not discuss the specific actions to be taken if shelter were recommended (e.g., close windows and stay in an interior room); improvised respiratory protection; or the nature of a release (e.g., gaseous plume or puff) so the public understands the importance of taking the recommended protective actions.

Based on the above findings, this portion of the licensee's program appears to be adequate, but the following matter should be considered for improvement:

- Expand the public information mailout/poster to include sheltering actions, improvised respiratory protection, and forms of releases and their relationship to protective actions. (50-271/82-05-68)

6.3 News Media

The auditors reviewed Emergency Plan Section 11. The auditors interviewed the licensee personnel responsible for implementation of the procedures for release of public information.

Two training seminars had been held for news media personnel on the Emergency Plan. The licensee stated that about 180 persons were invited.

The Emergency Plan stated that Vermont Yankee public relations staff will offer to conduct annual information programs to acquaint the news media with information regarding radiation, emergency public information procedures, the emergency classification system and a general review of plant characteristics. Local and state media will be invited and encouraged to attend.

Based on the above findings, this portion of the licensee's program appears to be adequate.

7.0 DRILLS, EXERCISES AND WALK-THROUGHS

7.1 Drills and Exercises Program Implementation

The auditors reviewed Emergency Plan Section 12 and Procedure OP 3505. The auditors also interviewed licensee personnel who would implement the procedure.

The required drills and exercises were conducted during the past year. The auditors reviewed a sampling of the licensee's drill records and noted that critique sheets and drill descriptions had been prepared as required by the emergency procedures (see Section 5.5.2 of this report). The critiques identified items requiring and the corrective action taken.

Based on the above findings, this portion of the licensee's program appears to be acceptable.

7.2 Walk-Through Observations

7.2.1 Control Room

The auditors performed four Control Room walk-throughs to evaluate the licensee's capability to perform accident classification, dose projection, execution of the appropriate implementing procedures, offsite notification and making protective action recommendations.

Each Shift Supervisor was presented with a set of plant conditions that represented Site Area and General Emergencies. The following areas were evaluated:

1. Accident Classification and Execution of Implementing Procedures.

Each Shift Supervisor proceeded to the appropriate procedure to classify the conditions presented (AP 3125).

The auditors observed that some Shift Supervisors would not have classified events at the General Emergency level even though the conditions presented warranted such a classification.

For stack monitor levels, the events would have been classified as "Alerts" since the EALs for Site and General Emergencies required dose calculations to be performed. The auditors were told by the Shift Supervisor that this was done because during the early phase of an accident, he would not have anyone to perform the dose calculations and that an "Alert" classification resulted in activation of the emergency organization. The auditors felt this was

appropriate during the very early phase of an accident; however, it must be stressed during training that dose calculations be performed as soon as possible to determine if conditions warrant a higher classification. For fuel damage conditions that represented loss of 2 of 3 fission product barriers (General Emergency EAL) the events were classified as a Site Emergency, since, this was the highest classification for which specific Control Room indicators were specified in the procedure. The auditors also questioned some Shift Supervisors on the meaning of the Site Area EAL "loss of physical control of the plant." This security-related EAL was misinterpreted as relating to the reactor not responding to Control Room actions.

Once the events were classified, the Shift Supervisor proceeded to the appropriate implementation procedure and demonstrated a good understanding of each step they were to take, except for recommending of protective actions offsite. The Shift Supervisor did not know the criteria to be used in deciding whether to recommend sheltering or no protective action as required by the procedure and did not know the relationship of core conditions and the appropriate protective actions to be recommended offsite.

The Shift Supervisor did not know the relationship of high-range containment monitor readings and core conditions, when iodine samples should be taken, or when KI should be given, and were not provided with any guidance on these issues in the procedures. Several members of the Control Room crews indicated that the location of the emergency communication equipment (in front of the main board) would interfere with their response during an emergency.

2. Dose Assessment

The auditors gave Control Room personnel on two shifts a set of accident parameters and asked them to calculate offsite dose. The Shift Supervisors designated the STA or HP tech on-shift to perform the dose calculations during the walk-throughs. Both individuals indicated they had been trained in doing the calculations within the last year.

The HP tech had considerable difficulty in working through procedure OP 3513 and did not provide timely estimates of the site boundary dose rate using the offsite dose rate nomogram or dose rates at downwind locations using the TI-59 calculator. The auditors emphasized the importance of obtaining a dose rate at the site boundary quickly, as this will be used as one of the bases for recommending protective actions. Several of the problems the HP tech had working through the procedure were the following: 1) not obtaining sufficient information from the met readout; 2) forgetting the meteorological readout indicated the direction the wind comes "from;" and, 3) difficulty in loading program cards into the calculator.

The STA was able to perform the dose calculations in a timely manner; however, he also had difficulty in loading the program cards and initially forgot the met data provided wind direction "from" and not "to."

Findings and observations summarized above were evaluated as part of the findings of Sections 3.2, 4.2.3. 5.3, 5.3.1, and 5.4.2 of this report.

7.2.2 EOF

The auditors conducted a walk-through of the EOF, in which licensee staff including an EOF Coordinator, Communicator, Radiological Assistant, and a Radiological Coordinator carried out their responsibilities during a simulated emergency. All participants appeared to understand their emergency duties.

The tag board used by the licensee appeared to be an effective method of establishing the EOF. Instrumentation (air sampler and high-range dosimeters) for determining EOF habitability was set up in a timely manner. The Radiological Assistant deployed offsite monitoring teams according to procedures and demonstrated ability to perform the necessary dose calculations. He noted that in an emergency, he would designate an assistant to do the dose calculations, to free himself to perform his other duties. This supports the recommendation in Section 3.2 that the Radiological Assistant may have too many responsibilities during an emergency.

The EOF Coordinator and Radiological Assistant demonstrated adequate usage of the EPA Protective Action Guides.

7.2.3 Offsite Monitoring

Two offsite monitoring teams consisting of two security guards and two HP technicians were chosen to conduct site boundary and offsite surveys as per instructions from procedure OP 3510. Emergency equipment kits were available in the security guard house and EOF, and contained all the necessary equipment as specified; in OP 3510. The teams functions were limited to taking dose rate readings with a PIC-6 and air samples using a portable air sampler and RM-14. The procedure provided the necessary data sheets and envelopes with labeling information were also available. The teams showed a working knowledge of communication procedures and the health physics instrumentation (e.g., operability checks, how to read the scales, how to count the cartridges). During the walk-through, the auditors simulated some high dose rates and the teams responded accordingly. All results and samples were supplied to the EOF Coordinator in accordance with procedures.

7.2.4 Post-Accident Reactor Water Sampling

The auditors conducted a walk-through of the licensee's reactor water sampling system to simultaneously evaluate organizational factors, equipment, facilities, procedures and training. Two chemistry/health physics technicians were chosen to simulate taking a reactor coolant sample. (Because of a unique installation design, a nonradioactive liquid sample could be taken to enhance periodic training sessions. This arrangement was used for the walk-through.)

The team described the type of protective clothing and choices for dosimetry, which included high range dosimeters (0 - 5R), TLD finger and whole-body badges, and cloth overalls. Respirators would also be used prior to taking a dissolved gas sample. The technicians stated they would be briefed by the OSC Supervisor before taking any post-accident sample, and doubted if they would have to take a sample during a backshift before augmentation of the site emergency organization.

The technicians were familiar with the procedure and sampling system. One technician read the valve numbers to be manipulated while the other followed his directions. A problem occurred when one valve could not be shut because the reach rod became disengaged from the valve. Because the reactor water was not introduced into the sample panel, the technician was able to go behind the shield wall and realign the set-pin for the reach rod and valve. This corrective action probably could not have been performed if the reactor water had contaminated the sample system.

When the proper valve arrangements were made and the gas and liquid sample was withdrawn, the technicians did not initiate radiation protection cautions. For example, the samples were not removed from the work area while flushing the system, the technicians manually handled the sample bottles, and carried the samples in an open-ended lead brick close to their bodies to the laboratory. Of course, not seeing real data from the survey instrument while scanning the sample limited the technicians' response. However, the lack of expected dose rate information within, the procedure prevented a thorough understanding of post-accident sampling conditions. In addition, an enclosed lead shield or sample cart would have been better choices for limiting doses.

Another part of the procedure called for flushing the sample panel and replacing the septums for the gas and liquid sample ports. The technician had difficulty in changing the septums and informed the auditors that he was not trained in the correct method for this procedural step. He stated he would contact his supervisor to determine how the septums should be replaced.

It was demonstrated by the technicians that the samples would be given to the chemistry and health physics assistant for analysis. The auditors noted that the gas dilution data sheet was not filled out by the sampling team and no data sheet for the liquid sample was available. The technicians did state that they would label the samples and place them in the chemistry lab lead pig for future analysis.

Based on the observations during the walk-through, individuals performed well consistent with their training.

Findings and observations summarized above were evaluated as part of the findings in Sections 4.1.1.6, 5.4.2.4 and 5.4.2.5.

7.2.5 Post-Accident Containment Air Sampling and Analysis

One chemistry/health physics assistant and one chemistry/health physics technician were charged with taking a containment sample. The two individuals described the type of protective clothing and dosimetry that they would require and estimated that it would take approximately 10 minutes to prepare before entering the sample location. Dedicated equipment for this procedure was acquired except for the syringe. Although the team was trained on the procedure, they were not aware of what length needle was necessary to withdraw a diluted sample from the sample cask. As in the reactor coolant walk-through, an actual sample was taken.

The technician had a slight problem releasing the quick-disconnect from the sample tap, but was successful after a repeated attempt. The sample was transported in a closed sample cask to the lab. The chemistry/health physics assistant took a diluted sample for analysis. During a discussion with the auditors, the assistant did not know what information to input into the computer for efficiency factors. He was also not aware that this information was included in a separate section of the post-accident sampling procedure. He informed the auditors that he received no training on counting high-activity samples. In addition, when the auditors related information concerning possible dose rates at the containment sample panel, the team had not been previously informed on these radiation precautions.

Based on the observations during the walk-through, the individuals performed well, consistent with their training. However, there were a few procedural problems and training deficiencies as discussed in Sections 3.2 and 5.4.2.6 of this report.

Table 1 Individuals Contacted

1. Licensee Personnel

*L. Anson	Plant Training Supervisor
H. Atkins	Lead Plant Mechanic
J. Babbitt	Security
B. Ball	Environmental Coordinator
*E. Bowles	Training Supervisor
R. Branch	Operations Supervisor
F. Burger	Quality Assurance Coordinator
A. Chesley	Shift Supervisor
L. Doane	SRO
M. Fuller	Chem & HP Tech.
D. Girroir	Mech. Engineerin
J. Harrison	Security Guard
D. Hapen	Security Guard
D. Holmquist	Security Guard
*E. Jackson	Manager of Operations
J. Jefferson	Tech. Services Supervisor
P. Klaski	Shift Supervisor
R. Leach	Plant H.P.
W. Lindquist	Shift Supervisor
T. Linn	TA Training
*M. Lyster	Operations Superintendent
*J. MacDonald	Manager, Radiation Protection Group (YNSD)
G. Madsen	Nuclear Safety Engineer
E. Matson	Asst. Plant Mechanic
R. Milligan	Administrative Supervisor
C. Momaney	Administrative Assistant
R. Marrissette	Chem. and HP Assistant
*W. Murphy	Plant Manager
R. Penniman	Security Supervisor
D. Phillips	Tech. Assistant
E. Porter	Chem. and HP Tech.
M. Prystupa	Plant Chemist
*J. Robinson	Director, Environmental Engineering Dept. (YNSD)
S. Skibniowsky	Emergency Planning Coordinator
D. Tolin	Whole Body and Resp. Sys. Engr.
D. Truesdell	Chem. and HP Tech.
D. Tuttle	SRO
*G. Weyman	Chem. and HP Supervisor
K. Whitney	Mech. Engineer
F. Winney	Assistant Chief Security

2. In addition to the above, members of the appraisal team also interviewed licensee members of plant operations, chemistry, health physics, maintenance, and technical staffs, and corporate staff personnel as well as local officials.

*Denotes those also present at the exit meeting.

Table 2 List of procedures reviewed

Site Emergency	
AP 3125	Emergency Classification
OP 3500	Unusual Event
OP 3501	Alert
OP 3502	Site Area Emergency
OP 3503	General Emergency
OP 3504	Emergency Communications
OP 3505	Emergency Preparedness Exercises and Drills
OP 3506	Emergency Equipment Readiness Check
OP 3507	Emergency Radiation Exposure Control
OP 3508	On-Site Medical Emergency Procedure
OP 3509	Environmental Sample Collection During an Emergency
OP 3510	Off-Site and Site Boundary Monitoring
OP 3513	Evaluaton of Off-Site Radiological Conditions
OP 3524	Emergency Actions by Plant Security Personnel
OP 3525	Radiological Coordination
OP 3530	Post Accident Sampling
Training	
AP 3700	Fire Training
AP 3712	Emergency Plan Training
Health Physics	
AP 0505	Respiratory Protection
AP 0506	Personnel Monitoring
RP 0520	Personnel Decontamination
OP 4530	Dose Rate Radiation Surveys
DP 4531	Radioactive Contamination Surveys
OP 4533	Airborne Rad. Concentration Determination
Chemistry	
OP 2610	Liquid Waste Disposal
DP 2630	Analytical Instrumentation
Operations Emergencies	
OP 2137	Process Radiaion Monitoring Systems
OP 3109	Anticipated Trans. Without Scram Emergency Proc.
OP 3110	Recirc. System Failures Emergency Procedure
OP 3111	Loss of Condenser Vacuum Emergency Procedure
OP 3112	Loss of Feedwater Emergency Procedure
OP 3113	Loss of Service Water Emergency Procedure
OP 3116	Loss of Reactor Coolant
OP 3117	Containment High Pressure Emergency Procedure
OP 3118	Loss of Auto Transformer Emergency Procedure
OP 3119	Loss of Startup Transformer

Table 2 (Continued)

OP 3120	High Off Gas Emergency Procedure
OP 3121	Fuel Element Failure Emergency Procedure
OP 3122	Excess Radiation Levels Emergency Procedure
OP 3123	SJAE Rupture Diaphragm Failure
OP 3124	Loss of Rx Coolant Outside Primary Containment
OP 3131	Shutdown from Outside of Control Room
OP 3140	Alarm Response
OP 5335	Met. Sys. Temp. Monitoring Fuct./Calib. Tests
OP 5336	Met. Sys. Wind Speed Monit. Fuct./Calib. Tests
OP 5337	Met Sys. Wind Direction Fuct./Calib. Tests
OP 5343	Back-up Meteorological Sys. Fuct./Calib. Tests

Table 3 List of Emergency Plan Sections

Sections	
1.0	Introduction
2.0	Definitions
3.0	Summary
4.0	Area Description
5.0	Emergency Classification System
6.0	Emergency Facilities and Equipment
7.0	Communications
8.0	Organization
9.0	Emergency Response
10.0	Radiological Assessment and Protective Measures
11.0	Emergency Notification and Public Information
12.0	Maintaining Emergency Preparedness
Appendices	
Appendix A	Emergency Classification System and Emergency Action Levels
Appendix B	Emergency Equipment
Appendix C	Internal Off-Site Whole Body Dose Rate Estimation
Appendix D	Yankee Mutual Assistance Plan
Appendix E	Letters of Agreement
Appendix F	Evacuation of Time Estimates
Appendix G	Public Notification System
Appendix H	Emergency Plan Implementing Procedures

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

APR 2 8 1982

Docket No. 50-271
CAL No. 82-13

Vermont Yankee Nuclear Power Corporation
ATTN: Mr. E. W. Jackson
Manager of Operations
411 Western Avenue
Drawer 2
West Brattleboro, Vermont 05301

Gentlemen:

This refers to a meeting between you and members of your staff and Mr. T. J. McKenna, Team Leader, and other members of the NRC Emergency Preparedness Implementation Appraisal team which was held at the Vermont Yankee Nuclear Power Station on March 24, 1982, and to a telephone conversation between you and Mr. Hilbert W. Crocker of my staff on April 23, 1982. With regard to the matters discussed relating to emergency preparedness, we understand that you will undertake and complete the following actions:

1. Perform a study to determine how the intent of the augmentation goals of NUREG 0654, Table B-1 can be achieved after the declaration of an emergency. The results of this study will be documented and a copy forwarded to the NRC Region I office for review and evaluation along with a description of compensatory measures for any augmentation goals not met.

   This will be accomplished no later than June 15, 1982.

2. Inspect and repair as necessary the reach rod couplings for the post-accident reactor water sampling panel to ensure proper valve manipulation.

   This will be accomplished no later than April 30, 1982.

3. Evaluate whether containment atmosphere samples are representative because of iodine plate-out in the sample vials and correct any deficiencies identified. Provide a written report on the results to the NRC Region I office.

   This will be accomplished no later than June 30, 1982.

4. Resolve the problems with the meteorological sensor resulting from foliage growth in the vicinity of the meteorological tower.

   This will be accomplished no later than June 15, 1982.

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5. Revise the implementing procedures to direct the Emergency Director, Emergency Coordinator or Recovery Manager, as appropriate, to recommend either shelter or evacuation, as core conditions or projected doses dictate, to all the plume EPZ States (Vermont, New Hampshire, and Massachusetts) and provide the criteria for making these recommendations. Provide training for those individuals on the criteria for making protective action recommendations relating to offsite consequences and provide offsite officials with an opportunity to review these criteria and their bases.

   This will be accomplished no later than July 20, 1982.

6. Provide new procedures or revise existing ones to include methods to distinguish radioiodine from noble gases in site boundary, in-plant, or offsite air samples. Such procedures should include trigger levels for purging and counting of charcoal cartridges on a high resolution system and for alternate use of silver zeolite cartridges.

   This will be accomplished no later than July 20, 1982.

7. Revise the procedure containing Emergency Action Levels (EALs) to address the requirements of NUREG 0654, Appendix 1. Train the Control Room staff and other appropriate individuals on the revised procedure.

   This will be accomplished no later than July 20, 1982.

8. Provide a backshift call-in documented method for notifying all appropriate emergency organization personnel down to the working level.

   This will be accomplished no later than July 20, 1982.

9. Revise the assessment procedures to:

   - include a method for initially obtaining an estimate of thyroid dose rate when plant conditions indicate that an offsite problem may exist (this should include the criteria used to indicate when to perform this function);

   - provide a method for making initial dose projection if installed Control Room instrumentation is inoperable; and,

   - provide Control Room personnel with the relationship of high-range containment readings to core condition (i.e. gap release or core melt).

   This will be accomplished no later than June 1, 1982.

If our understanding of your planned actions, described above, is not in accordance with the actual plans and actions being implemented, please contact Mr. H. W. Crocker of this office by telephone (215) 337-5000, within 24 hours.

Sincerely,

Gilbert H. Cocker for

George H. Smith, Director
Division of Emergency Preparedness
and Operational Support

cc:
Mr. W. F. Conway, President and Chief Operating Officer, Vermont Yankee Nuclear Power Corporation (VYNPC)
Mr. Warren P. Murphy, Plant Manager, VYNPC
Mr. L. H. Heider, Vice President, Yankee Atomic Electric Company
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
State of New Hampshire
State of Vermont

Vermont Yankee N
ATTN: Mr. E. W. Jackson
Manager of Operations
411 Western Avenue
Drawer 2
West Brattleboro, Vermont 05301

Gentlemen:

Subject: CLARIFICATION OF DATES IN CONFIRMATORY ACTION LETTER 82-13

This refers to a telephone conversation between Mr. M. Lyster of your staff and Mr. N. M. Terc of the NRC Emergency Preparedness Section concerning the dates of items 8 and 9 of our Confirmatory Action Letter (CAL 82-13) dated April 28, 1982. With regard to items 8 and 9 of that letter, we understand that you will undertake and complete actions in the revised dates as follows:

8. Provide a backshift call-in documented method for notifying all appropriate emergency organization personnel down to the working level.

   This will be accomplished no later than June 1, 1982.

9. Revise the assessment procedures to:

   - include a method for initially obtaining an estimate of thyroid dose rate when plant conditions indicate that an offsite problem may exist (this should include the criteria used to indicate when to perform this function);

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Sincerely,

George H. Smith, Director
Division of Emergency Preparedness
and Operational Support

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

Docket No. 50-271

07 MAY 1982

Vermont Yankee Nuclear Power Corporation
ATTN: Mr. E. W. Jackson
Manager of Operations
411 Western Avenue
Drawer 2
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Sincerely,

George H. Smith, Director
Division of Emergency Preparedness
and Operational Support

Dupe of ~~[illegible]~~

cc:
Mr. Robert L. Smith, Licensing Engineer
Mr. Warren P. Murphy, Plant Manager
Mr. W. F. Conway, President and Chief Operating Officer
Mr. L. H. Heider, Vice President
Public Document Room (PDR)
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Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
State of New Hampshire
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