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

REGION I

Emergency Preparedness Appraisal

Report No. 50-272/81-07
50-311/81-08

Docket No. 50-272
50-311

License No. DPR-70
DPR-75

Priority -

Category C
B-2

Licensee: Public Service Electric and Gas Company

80 Park Place

Newark, New Jersey 07101

Facility Name: Salem Nuclear Generating Station (SNGS), Units 1 & 2

Appraisal At: SNGS, Hancocks Bridge, New Jersey

Appraisal Conducted: March 23-April 2, 1981

Team Members:

Dale E Donaldson — 5/13/81
D. E. Donaldson, Radiation Specialist, NRC (Team Leader) — date

5/13/81
N. Terc, Radiation Specialist, NRC — date

for Robert J Bores — 5/13/81
E. Vojnas, Radiation Specialist, NRC — date

for Robert J Bores — 5/13/81
M. Mojta, Radiation Specialist, (Intern), NRC — date

for Dale E. Donaldson — 5/13/81
T. McKenna, Emergency Planning Analyst, NPC — date

for Dale E. Donaldson — 5/13/81
B. Zalcman, Staff Meteorologist, NRC — date

for Robert J. Bores — 5/13/81
C. Gallina, Ph.D, Emergency Planning Coordinator, NRC — date

for Dale E. Donaldson — 5/13/81
D. Andrews, Radiation Specialist, NRC — date

for Dale E. Donaldson — 5/13/81
M. Smith, Battelle Laboratories — date

for Dale E. Donaldson — 5/13/81
C. Palmiter, Battelle Laboratories — date

Approved by: Robert J. Bores — 5/13/81
R. J. Bores, Ph.D, Acting Chief, Emergency Preparedness Section — date

CONTENTS

SUMMARY

The appraisal of the state of onsite emergency preparedness at the Salem Nuclear Generating Station (SNGS) involved seven general areas:

Administration of the Emergency Preparedness Program Development;

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 development of the SNGS Emergency Preparedness Program was performed by individuals in the corporate office in Newark, NJ and by individuals at the SNGS. The results of the appraisal indicated that the existing program contained a number of deficient areas. The appraisal findings indicate that the cause of these deficiencies was ineffective administration and management of the overall development and implementation of the emergency preparedness program. Plan and procedure incongruities, conflicts and omissions, in particular, gave the appearance that there had been a lack of continuity and coordination between the licensee's corporate and site emergency planning staffs during the development process. These observations were substantiated during discussions with the site and corporate planning and management staffs.

The licensee's emergency organization description was incomplete in that it did not adequately define the responsibilities and interrelationships for performing the various emergency tasks and functions described in the Emergency Plan. Within the scope of procedures developed to implement the Emergency Plan there were conflicting and unclear delineations of key duties and responsibilities related to overall coordination of the response and protective action recommendations. The licensee's emergency action levels were not understandable to the primary users who would be responsible for detecting emergency conditions and initiating appropriate emergency actions. The training program was not completely developed but individuals had received some training which was supplemented by participation in several drills over the past month. Observation and questioning of selected individuals during walk-throughs of their assigned emergency tasks and functions indicated that the individuals were aware of many of the organizational and procedural shortcomings but could perform effectively in spite of them.

Licensee coordination with various non-licensee agencies other than with the NRC was adequate.

The auditors concluded that the licensee appeared to be capable of responding to and managing the response to events of limited scope and duration. The ability to respond and manage the response to broader scope events of longer duration, however, was suspect and the team concluded that there was not reasonable assurance that such a response could be effectively implemented given the present state of development of the preparedness program.

1.0 ADMINISTRATION OF EMERGENCY PREPAREDNESS

Sections 17.0 and 18.0 of the SNGS Emergency Plan described the licensee's assignment of responsibility for the planning effort. The corporate General Manager- Nuclear Production was assigned responsibility for Public Service Electric and Gas Company radiological emergency response planning; one of four functional areas over which the General Manager-Nuclear Production exercised general management responsibility. The Manager-Emergency Preparedness, located at the corporate office, reported to the General Manager - Nuclear Production and was assigned responsibility for developing, updating and coordinating the Emergency Plan with other response organizations. Discussions with the Manager-Emergency Preparedness indicated that he was also charged with responsibility for the development of the implementation scheme for the corporate portion of the emergency response and recovery management roles and for the coordination of this scheme with the implementation scheme of the site. He was assisted by three engineers, all of whom were located at the corporate office in Newark.

The Assistant to the Manager-Salem Nuclear Generating Station was assigned responsibility for the development and maintenance of the implementation scheme for the site aspects of the Emergency Plan and for the coordination of the implementation scheme with the corporate Manager-Emergency Preparedness. An engineer at the plant had been designated to support the Assistant to the Manager in developing and reviewing emergency plan procedures and

in preparing scenarios for drills and exercises. In addition, the SNGS Radiation Protection Engineer had been involved in the development of major portions of the site implementation scheme, primarily in the areas related to radiation protection, chemistry and environmental monitoring. Figure 1 of Annex B depicts the elements of the PSE&G organization involved in the development of the Emergency Plan and implementation scheme.

During discussions with the licensee representatives responsible for the planning effort, the auditors noted that although authority for plan and procedure development was clearly described in Sections 17.0 and 18.0 of the SNGS Emergency Plan, the description was inadequate in that it failed to assign responsibility for overall working level management of the development and implementation effort. The Emergency Plan and Recovery Management Procedures appeared to have been developed at the corporate level without sufficient coordination with the site, while other procedures appeared to have been independently developed at the SNGS. Further, within the station organization, certain implementing procedures (those related to radiological safety, chemistry and environmental monitoring) appeared to have been developed in advance of and without sufficient coordination with those developed under the authority of the Assistant to the Manager, SNGS. (See Section 5.0)

During the appraisal, the auditors also noted that the emergency organization (Section 2.0) and training program (Section 3.0) were not incompletely developed, and had inadequate implementation and management overview.

Further discussions with the licensee individuals responsible for the planning effort and review of available resumes indicated that the Manager-Emergency Preparedness had over 12 years experience in the nuclear industry of which the last 5 months were related to emergency preparedness. The Emergency Planning and Security Engineer had over 7 years nuclear experience with PSE&G of which the last 8 months were related to emergency preparedness. The two Lead Engineers reporting to the Emergency Planning and Security Engineer had about 1 year and 7 months of emergency preparedness experience, respectively.

The Assistant to the Manager, SNGS, held a current SRO licensee and had over 13 years of nuclear experience with PSE&G, of which the last 4 years have involved responsibilities in emergency preparedness. The engineer assigned to support the Assistant to the Manager had about 6 years of nuclear experience with PSE&G, of which the last 2 years have included responsibilities in emergency preparedness.

Discussions with the site and corporate individuals responsible for the planning effort within the licensee's organization indicated that the individuals possessed a general understanding of the principles involved

in developing plans and procedures. The auditors noted, however, that there were no selection criteria or qualification statements for the individuals filling positions related to emergency preparedness planning activities. A licensee representative stated that there had been discussions by corporate level management concerning the establishment of selection and qualification criteria for individuals responsible for emergency preparedness planning and implementation activities, but that no criteria had been established as of the time of the appraisal.

Since there were no selection criteria or minimum qualification criteria implemented within the licensee's organization, there were no clear provisions established for training the individuals to fulfill minimum criteria of these positions. Section 17.2 of the SNGS Emergency Plan addressed training for the individuals responsible for the planning effort and stated "the training program for personnel responsible for the planning effort is equivalent to the training program for emergency response personnel but does not include drills." This general concept had not been formally implemented, apparently due to the licensee's failure to have adequately implemented the training program for emergency response personnel. (See Section 3.0) The inspectors also noted that there were no provisions or existing plans to provide professional development training for those individuals currently holding emergency

planning positions to insure the maintenance of state-of-the-art knowledge. A licensee representative stated that a training program for the currently assigned individuals and for future individuals who may hold these positions is currently under consideration but had not been defined or implemented.

An evaluation of the findings in other areas of the licensee's emergency preparedness program, indicated that, although the various individuals appeared to have been given adequate responsibility, authority and resources, and possessed a fundamental knowledge sufficient to enable them to perform their assigned duties, the licensee's organizational structure in conjunction with the responsibility assignments failed to result in the proper degree of internal coordination necessary for the development and implementation of an acceptable program.

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

- Designation of a single individual within the PSE&G organization who shall be given direct working level responsibility for and authority over all aspects of the development and maintenance of the emergency preparedness program (272/81-07-01; 311/81-08-01).

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

- Development and implementation of selection and qualification criteria for individuals performing emergency preparedness development activities (272/81-07-02; 311/81-08-02); and

- Development of a program for training individuals who are assigned emergency planning responsibilities which will enable them to attain and maintain a state-of-the-art knowledge in the field of emergency preparedness (272/81-07-03; 311/81-08-03).

2.0 EMERGENCY ORGANIZATION

2.1 Onsite Organization

The auditors reviewed the SNGS Emergency Plan (Rev 0, undated) and implementing procedures and held discussions with licensee personnel to evaluate the adequacy of the definition of the onsite emergency organization and the assignment of emergency duties and responsibilities. This evaluation was preliminary to determining the adequacy of the licensee's emergency preparedness training program and procedures developed to implement the Emergency Plan.

The starting points for the onsite emergency organization evaluation were Sections 2.1 and 3.1 of the SNGS Emergency Plan. These sections established 10 broad areas of emergency activity and outlined the general duties and responsibilities to be performed by the person(s) assigned to the broad areas. The broad area designations were as follows:

Functional Area	Personnel Assigned
Emergency Duty Officer (EDO)	Senior Shift Supervisor Senior shift member of the station organization present initially EDO qualified individual

Shift Organization and Management	Senior Shift Supervisor Shift Supervisor
Operating Departmen. Management	Station Manager Chief Engineer Operating Engineers Station Operating Supervisor
Shift Technical Advisor	Shift Technical Advisor
Shift-Operators and Technical Support Personnel	Licensed Members of Operating Shift Unlicensed Member of Operating Shift Performance Department Personnel Maintenance Department Personnel
Emergency Radiation Survey Teams	Technician - Nuclear (Shift T/N) Qualified Radiation Protection Personnel
Fire Brigade and First Aid Team	Designated by the Chief Engineer as Recommended by the Safety Supervisor
Personnel Accountability Team	Security Force Personnel Highest Ranking Employee(s) at each accountability station
Search and Rescue Team	Assembled from available station personnel
Onsite Technical Support	Safety Review Group Radiation Protection Engineer Senior Supervisor - Radiation Protection

The above description was supplemented by Table III-1 of the SNGS Emergency Plan, Minimum Staffing Requirements for Salem Units 1 & 2, which listed major functional areas of emergency activity and related tasks, position titles/expertise and staffing levels for the functional areas. This table approximated Table B-1 of NUREG-0654, Rev 1. The auditors compared the written descriptions of the onsite emergency

organization from Section 2.1 and 3.1 and Table III-1 of the Emergency Plan with the onsite emergency organization chart (Figure III-1 of the Emergency Plan). This organization chart is included as Figure 2 of Annex B to this report. The auditors noted that the emergency organization chart and written description of the emergency organization more closely resembled the normal organization and did not identify the relationships of the functional areas of emergency activity contained in Table III-1 of the Emergency Plan.

Within the scope of the SNGS Emergency Plan there was no clear delineation of the emergency organization in terms of the functional areas of emergency activity, assignment of responsibilities for individuals who would take charge of each functional area in an emergency, or specific interfaces among the elements of the onsite emergency organization. In many cases the Emergency Plan did not specify the individuals, by position or title, who would be selected for qualification to assume the responsibilities in each functional area of the emergency organization beyond the 90 minute minimum staffing requirements as depicted in Table III-1 of the SNGS Emergency Plan. In at least one instance the Emergency Plan referred to a position title (Performance Supervisor-RP) which was vacant within the existing station organization. In other instances the Emergency Plan indicated that certain emergency functions such as chemistry and repair/corrective actions, would be performed by teams assembled

from a manpower pool of various technical specialties. Discussions with individuals responsible for the planning effort indicated that organizational provisions for emergency chemistry and repair and corrective actions had not been fully developed. The auditors further noted that the manpower pool relied upon may not be available when needed since EP I-12, Evacuation, could result in their having already left the plant site. (See Section 5.4.3.2)

A further review of the licensee's implementation of the emergency organization described in the Emergency Plan indicated that the radiation protection procedures developed for use during emergencies described an organizational structure and responsibilities that were in some cases contradictory to or not reflected in the Emergency Plan description of the onsite and corporate augmentation organizations. The auditors held discussions with the SNGS Radiation Protection Engineer and reviewed the SNGS Radiation Protection Manual and determined that the radiation protection group had developed and implemented an emergency organization description and charts which were neither approved nor disseminated outside the radiation protection group, (nor reflected in the Emergency Plan; See Figures 3, 4, and 5 of Annex B to this report). Individuals were assigned (by title and name) to the functions depicted in the chart; however the assignment of responsibilities and organizational configurations were inconsistent

with other documents which implemented the Emergency Plan and with the understandings of individuals having emergency duties outside the SNGS radiation protection group.

The auditors noted that the SNGS Emergency Plan description of the emergency organization provided for an individual designated as the Emergency Duty Officer (EDO) who was responsible for overall coordination and direction of the licensee's response and that this individual had been given authority and responsibility consistent with NUREG-0654, items A.1.d, B.2 and B.4. A line of succession was clearly specified as were selection criteria. The implementation of this concept, however, was found to be inconsistent with the description in that, in the Emergency Plan, a position in the recovery organization, the Recovery Manager, was stated to be responsible for certain of the non-delegatable responsibilities of the EDO (See Section 2.2 for additional details).

Based on the above findings the following improvements are required to achieve and acceptable program:

- Revision of the description of the onsite emergency organization in Section 3.1 and Figure III-1 of the SNGS Emergency Plan to reflect functional areas of emergency activity, reporting chains (management structure) and interrelationships of the

functional areas down to the working level consistent with Table B-1 of NUREG-0654 and Table III-1 of the SNGS Emergency Plan. (272/81-07-04; 311/81-08-04)

- Inclusion of an approved list of licensee personnel (by name) in the Emergency Plan implementing procedures who have been selected and are qualified to perform activities within the functional areas of the onsite emergency organization to which they are assigned. (272/81-07-05; 311/81-08-05)

2.2 Augmentation Organization

The auditors performed a similar review of the licensee's emergency planning documents (Recovery Manual Implementing Procedures and Sections 3.2 through 3.5, 4.0 and 14.0 of the SNGS Emergency Plan) to evaluate the adequacy of the definition of the licensee's augmentation of the onsite emergency organization.

Augmentation of the onsite organization was classified as "Local Services Support, State and County (Local) Government Response, Other Organizations, and Augmented Emergency Organization." Augmentation from local services support included medical support, provided by the Salem County Memorial Hosptial and Radiation Management Corporation (RMC). The auditors noted that the Emergency Plan and

implementing procedures adequately presented the organizational relationships and authorities of the local services support in relation to the licensees emergency organization. The same was found to be true for the description of the state and county response organizations.

Within the category "Other Organizations," the PSE&G Research Corporation-Energy Laboratory and Westinghouse Electric Company, the NSSS vendor, were included. Discussions with licensee personnel indicated that at least two other organizations, Porter Consultants and Ichthyological Associates, would be providing augmentation support, but were not reflected in the organization description section of the Emergency Plan, but rather in Section 4.0, Emergency Response Support and Resources. Discussions with management of Porter Consultants indicated that this organization had not been made fully aware of their authorities or place in the augmented emergency organization. In all cases where non-licensee groups were relied upon, the working interfaces between the functional areas of emergency activity of the licensee's organization and the non-licensee groups were not described, neither in the Emergency Plan nor in implementation documents.

Long term augmentation of the onsite emergency organization was stated to be provided by the corporate office in accordance with the Recovery Management Plan (Section 14.0 of the SNGS Emergency Plan).

The auditors reviewed Section 14.0 of the Emergency Plan, reviewed the procedures developed to implement this section and held discussions with licensee representatives to verify that the corporate organization which will augment the onsite emergency organization had been defined; that interfaces among the corporate organization and with the station organization had been delineated; and that the identified corporate functions were consistent with the licensee's overall emergency reponse organization, the procedures which implement the emergency plan, and guidance contained in NUREG-0654, Revision 1.

The corporate organization depicted in Figure 14-2 of the Emergency Plan and described in Section 14.0, included the positions shown in Figure 6 of Annex B to this report. The auditors noted that the description of the corporate PSE&G emergency organization in the Emergency Plan and procedures only identified the management positions that "are to act in a support and advisory capacity to the EDO."

In reviewing the organizational structure and functions of the corporate emergency organization, the auditors noted that, upon full augmentation, the functional area of radiological field monitoring and dose assessment would become the responsibility of the corporate organization located at the EOF and headed by the Recovery Manager (RM). The assignment of authority and responsibilities to the Recovery Manager by the Recovery Manual Implementing procedures appeared to conflict with those of the EDO. The division of authorities

between the RM and EDO was inconsistent with the concepts articulated in Sections 3.1 and 14.0 of the Emergency Plan and with the guidance of NUREG 0654. The Emergency Plan and NUREG 0654 set forth the concept of vesting overall coordination responsibility in a single individual and that this individual has certain non-delegatable responsibilities, among which are notifications to state and local authorities and the making of protective action recommendations to them. While Section 3.0 of the Emergency Plan stated that the "EDO shall recommend protective actions to authorities responsible for implementing offsite emergency measures," the auditors noted that Section 14.0 of the Emergency Plan and the Recovery Manual Procedures showed this function to be under the direction of the Radiological Emergency Manager (REM) who, in turn would report to the Recovery Manager. In discussing the organizational relationship of the EDO (located onsite in the TSC) to the RM and REM (offsite at the EOF) the auditors noted that there was no consistent procedural description which defined the relationship. Further review indicated that the various organizational configurations, relationships and assignment of responsibilities explained in the Emergency Plan and implementing procedures were contradictory. The resultant corporate emergency organization, therefore, did not properly interface with the station organization, since the functional areas identified did not correspond to the functional areas of the station emergency organization. There was no clear reporting chain to provide information to the single individual having the authority for overall responsibility

for coordination and direction of the emergency organization (assumed to be the EDO), so that rapid assessment of the emergency and timely recommendations for protective actions could be made. The auditors determined that this was due, in part, to the conflicting yet mutually exclusive responsibilities given to the EDO, RM and REM as well as the organizational structure which placed offsite monitoring activities under the control of the RM at the EOF. The aforementioned confusion was exhibited during walk throughs of protective action decision-making wherein the EDO recommendation was overruled by the RM. (See Section 7.0)

These organizational and responsibility conflicts contributed to shortcomings in the licensee's staffing and conceptual use of the TSC and EOF (described in Sections 4.1.1.2 and 4.1.1.4 of this report.

During discussions with licensee representatives, the auditors determined that implementation of Section 14.0 of the Emergency Plan (Recovery Management Plan) had been performed independently of the station portions of the Emergency Plan and implementing procedures. Although there were provisions within the corporate organization for various emergency functions to be performed, overall coordination of

the descriptions of the functions to be performed by the station organization with the descriptions of the functions to be performed by the corporate organization was not apparent.

Based on the findings in the above areas the following improvement is necessary to achieve an acceptable program:

- Revision of the Emergency Plan and implementing procedures to clearly identify the functional areas of emergency activity support to be provided to the station organization, reporting chains, and the interfaces between the corporate and non-licensee augmentation organizations and the station emergency organization down to the working level (272/81-07-06; 311/81-08-06).

- Inclusion of an approved list of licensee personnel (by name) and non-licensee organizations in the Emergency Plan implementing procedures who have been selected and are qualified to perform activities within the functional areas of the corporate emergency organization to which they are assigned (272/81-07-07; 311/81-08-07).

3.0 EMERGENCY PLAN TRAINING/RETRAINING

3.1 Program Establishment

The licensee's program for training individuals assigned emergency duties and responsibilities was outlined in Section 16 of the SNGS Emergency Plan and included general employee indoctrination and specialized training for members of the emergency organization on their specific emergency plan duties. Categories of specialized training were listed as: Emergency Directors/Coordinators; Accident Assessment Personnel; Radiological Monitoring Teams and Radiological Analysis Personnel; Police/Security and Fire Fighting Personnel; Repair and Damage Control Teams; First Aid and Rescue Personnel; Local Support Service Personnel; Medical Support Personnel; Corporate Support Personnel; Communications Personnel; and Media/Public Information Personnel. Administrative Procedure No. 14 specified that "Training Programs shall provide a means for evaluating the programs effectiveness by one or more of the following listed methods:"

1. Written examinations or quizzes

2. Oral examinations, quizzes or examination or discussion, or

3. Practical examinations or demonstrations

Through interviews with plant management, the auditors noted that responsibility for actually conducting emergency training had been delegated to the following departments in the licensee's organization: Security Department; Training Department; Radiation Protection Department; Assistant to the Manager-Salem Nuclear Generating Station; Radiation Management Corporation; and the Manager-Emergency Preparedness (in the corporate office).

The Emergency Plan specified that the Assistant to the Manager-Salem Nuclear Generating Station coordinates training of all personnel with an onsite response role and "other support agencies" requiring training. The Manager - Emergency Preparedness coordinates training for corporate personnel who provide support to the station emergency organization. Table II of the Emergency Plan specified that training for station and offsite organizations will be conducted annually. The SNGS Emergency Plan Manual Implementation Procedures, Section II identified the organizations responsible for lesson plan preparation, attendance documentation and quiz results for the following emergency personnel: Station Personnel; EOO; Radiation Survey Teams; Medical Support; and Local Fire Department.

The auditors reviewed available site and corporate lessons plans for training of emergency response personnel and noted that lesson plans were, for the most part, general in nature or simply consisted of the procedures applicable to the attendees' emergency function. It

was also noted that lesson plans for the following onsite areas of emergency activity were stated to be under development: Communicator; Security; Damage Control; Department Heads; Reactor Operators, Senior Reactor Operators and Shift Technical Advisors. There were criteria to be used to determine if the trainee could successfully perform the emergency functions or tasks. The Radiation Protection Department had documented test results for the emergency task training which they had conducted. Since the licensee personnel who would be assigned to the onsite functional areas of emergency activity were not clearly defined, except in the area of Radiation Protection, the auditors were unable to correlate the categories of specialized training with functional areas of emergency activity in the existing emergency organization description (See Section 2.1). The auditors further noted that there was no documented training program for corporate personnel having emergency duties. The auditors were, therefore, not able to verify and the licensee could not provide information that a documented training program existed to provide reasonable assurance that all appropriate personnel had been or would continue to be trained.

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

- Development of a documented program consistent with AP-14 for qualifying (training) individuals and groups who are selected for assignment to the various functional areas of emergency activity down to the working level, to include, as a minimum (272/81-07-08; 311/81-08-08):

  a. Lesson plans;

  b. Training objectives to be met;

  c. The means to be used to verify attendee performance against the training objectives; and

  d. The means to be used to train members of the emergency organization in changes of assignment or to facilities, equipment and procedures which may occur in the period of time between scheduled training iterations.

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

- Development of a means by which completed training will be documented to verify that all required training has been performed (272/81-07-09; 311/81-08-09).

- The designation of emergency preparedness instructor qualifications (272/81-07-10; 311/81-08-10).

3.2 Program Implementation

Discussions with management and review of available training records indicated that the EDOs, Communicators, Department Heads, and STAs were trained but not tested on their ability to perform their emergency functions. Corporate augmentation personnel training involved "table-top exercises" on their functions. Discussions with licensee management indicated that no training had been conducted for repair and corrective action teams. The auditors concluded that this was due, in part, to the incomplete description of the emergency organization and lack of procedures governing these activities (see Sections 2.1 and 5.4.5). Discussions with management and plant personnel also indicated that radiation protection personnel had been walked-through dose assessment functions but that there had been no formal demonstration of their ability to perform this assigned emergency task or documentation of material covered. Licensee management stated (a spot check by the auditors confirmed), that radiation protection personnel had, in many cases, been tested on their ability to perform their assigned emergency tasks. Discussions with security personnel and review of records indicated that they were tested on their ability to perform their emergency functions.

The auditor(s) conducted walk-throughs and discussions with plant on-shift personnel relative to their shift responsibilities, and concluded that personnel were aware of their general responsibilities, the procedures they were to implement, as well as shortcomings which existed in the procedures. Several key individuals, however, had difficulty performing their assigned tasks during the walk-throughs (See Section 7.2). Discussions with these personnel confirmed that, while they had received training, they had not been required to demonstrate their ability to perform the tasks for which they were trained.

While it appeared that some emergency plan training had been performed, it appeared to be uncoordinated and narrow in scope. The auditors could not verify that all individuals assigned emergency duties and responsibilities had been trained since the emergency organization definition was incomplete and did not correlate with the categories of specialized training set forth in the existing training program.

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

- Verification that the specific licensee and non-licensee groups or individuals assigned to the various functional areas of emergency activity have received training or attained a level of proficiency sufficient to permit them to perform emergency

duties assigned in accordance with the response scheme outlined in the SNGS Emergency Plan and specifically defined in the implementing procedures which will cover their emergency activities (272/81-07-11; 311/81-08-11).

4.0 EMERGENCY FACILITIES AND EQUIPMENT

4.1 Emergency Facilities

4.1.1 Assessment Facilities

4.1.1.1 Control Room

The control rooms for both units, the Senior Shift Supervisor's office and a hallway between the two control rooms were connected and designated as the "Control Area." The auditors toured this area and interviewed several Senior Shift Supervisors during the course of the appraisal.

The auditors noted that current copies of the Emergency Plan Manual Implementation Procedures, Emergency Plan, Evacuation Analysis, and Emergency Instructions were in the Senior Shift Supervisor's office. There were, however, no copies of the Radiation Protection Instructions or Recovery Manual in the Control Area although Radiation Protection Instruction PD 14.12.212 "PAG Initiation" contained procedures that were to be implemented by the Senior Shift Supervisor (See Section

4.4.2 for related findings). Meteorological data were displayed only in the Unit 1 Control Room. The control rooms could, however, communicate using the in-plant telephones and page system. In addition, the Senior Shift Supervisor had common access to both control rooms thus allowing rapid communication.

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

4.1.1.2 Technical Support Center (TSC)

The TSC was located on the third floor of the Clean Facility Building approximately 100 meters from the Unit 1 containment and outboard steam generator steam dumps. The TSC contained approximately 1500 square feet of open area. The Clean Facility was a metal fabricated building with windows facing the containment. The plant document control and file area was located on the floor below the TSC and was the source of plant drawings. Access to the control room from the TSC was by a route going down three flights of stairs and then along an unshielded hallway.

Transit time from the TSC to the control room is approximately three to four minutes. The TSC was provided with direct telephone lines to the NJ State Police, Lower Alloways Creek, Salem and Cumberland Counties in New Jersey, and New Castle and Kent Counties in Delaware. A NAWAS line was provided for communications to Delaware Civil Defense. Direct lines were also provided to both control rooms and to the Senior Shift Supervisor's office. Approximately fifteen other outside telephone extentions were available on other non-dedicated phones. The plant radio system provided communications with the field monitoring teams, cars assigned to "on call" EDO-qualified personnel and the EOF. The TSC was provided with a computer terminal and CRTs which could access the selected plant parameters from the plant computer. The auditors noted, however, that neither the plant parameter information displayed in the TSC nor the terminal "operations manual" indicated the parameter units. The auditors also noted that operation of the CRT at the TSC resulted in loss of the control room CRTs. Furthermore, activation of

the TSC terminal required that manual switching be carried out in the control room computer room. No procedures were found for this operation.

Radiation monitors, survey instruments, high and low range dosimeters, air samplers, a CAM, protective clothing, respirators, area maps with [illegible]ors marked, and emergency and radiological procedures were located in the TSC. The auditors were provided with a demonstration of the computer terminal and demonstration of how plant drawings will be obtained from the document room. The auditors were informed by plant management that if drawings were required from the document room, members of the normal document control staff would be called. These personnel were not, however, identified as part of the emergency organization. The TSC was a open area with no assigned work areas specified. The NRC ENS and HPN lines were located in a congested area with many other phone lines. No outside phone lines were specifically designated for NRC use. In reviewing the licensee's concept of use of the TSC as demonstrated by the staffing and procedures, the auditors determined that the TSC did not

appear to be staffed or used in line with the concept of NUREG 0578. In addition to the technical support function, the TSC was to be used also as an onsite EOF. The auditors noted that, in turn, many of the evaluation and coordination functions and authorities normally expected to be located in the EOF were split between the TSC and the EOF (See Section 4.1.1.4). This was determined to be, in part, a result of the faulty organization description (See Section 2.0).

Licensee management stated that the existing TSC location was to be upgraded to meet the NRC requirements for a permanent TSC. While construction is taking place the interim TSC will be relocated to the second floor of the Clean Facilities Building. The auditors inspected the anticipated location and noted that it was about 1/4 the size of the existing interim TSC. The auditors informed the licensee that the interim TSC would be reevaluated following its relocation (272-81-07-12; 311/81-08-12).

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

- Review of the conceptual use and staffing of the TSC in light of organizational changes which occur as a result of action on items identified in Sections 2.1 and 2.2 (272/81-07-13; 311/81-08-13).

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

- Habitability and acoustics of the interim TSC (272/81-07-14; 311/81-08-14);

- Allocation of specific work areas having the ENS, HPN and at least two dedicated commercial telephones for the NRC (272/81-07-15; 311/81-08-15);

- Provision to allow identification of the units of the plant parameters displayed on the computer (272/81-07-16; 311/81-08-16);

- Provision to display plant parameters on the TSC CRT without interrupting the display on the control room CRT (272/81-07-17; 311/81-08-17);

- Development of procedures for technical document retrieval and plant data transmission (272/81-07-18; 311/81-08-18).

4.1.1.3 Operational Support Center (OSC)

The OSC was designated as the area encompassing the Senior Shift Supervisor's office, file room and the aisleway between the Unit 1 and Unit 2 Control Rooms. The Emergency Plan Manual Implementing Procedures specified that during a radiation alert, operations personnel reported to the OSC. The OSC provided the same level of protection from direct radiation and airborne contamination as the control room; therefore, a backup location was not provided. Communication between the OSC, EOF, and TSC was provided by the radio and telephone systems located in the Shift Supervisor's office. Eight self-contained breathing devices were located in an area outside

the OSC. Portable radios for use by individuals dispatched from the OSC were located in the Senior Shift Supervisor's office and could be used throughout the plant.

The Emergency Plan Implementation Procedures specified that, during a radiation alert, radiation protection personnel reported to the HP Control Points in the plant and that other plant personnel reported either to the administration building or cafeteria assembly areas. The personnel reporting to the Control Point had access to self-contained breathing devices, survey instruments and other protective equipment. They were not, however, provided with radios that could be used throughout the plant. The personnel required to perform various technical operations such as damage control and chemistry would be among the group reporting to the cafeteria, not to the OSC. None of these personnel were identified as part of the emergency organization and therefore could be evacuated as part of the "non-essential" plant personnel (See Sections 2.1, 5.4.3.2 and 5.4.5 for related findings).

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

- Re-evaluation of the adequacy of the staffing and the physical characteristics of the OSC in light of organizational changes which occur as a result of action on items identified in paragraph 2.1 (272/81-07-19; 311/81-08-19).

4.1.1.4 Emergency Operations Facility (EOF)

The EOF was located at the licensee's Quinton Training Center, seven air miles from the plant. It required the auditors twenty-six minutes to travel from the site to the EOF under light traffic conditions. The auditors noted that the current Emergency Plan Manual Implementation Procedures and Recovery Plan Procedures were available. The EOF was divided into several offices dedicated, during emergencies, to dose assessment, New Jersey and Delaware State government personnel, the NRC, and various licensee managers of the recovery management organization.

The auditors toured the facility and observed an operational check of the base station radio. This radio is not normally located at the EOF, but will be transported to the EOF by a security guard dispatched from the site to activate the EOF. The EOF contained survey equipment, air samplers, a SAM 2 with silver zeolite cartridges, TLDs, high and low range dosimeters, area maps, isopleths and first aid and decontamination supplies. Wind speed and direction instruments were located on a pole at about 30 foot elevation outside the EOF and had a readout in the EOF. There were dedicated communications with the States of Delaware and New Jersey and the counties within the plume EPZ. The ENS and HPN phones were not installed, however, and resolution is underway by the appropriate NRC office. Approximately twenty phone lines were available with lines dedicated to each working area. The base station radio provided backup communications with the TSC and field teams.

In reviewing the licensee's conceptual use of the EOF, the auditors determined that the EOF did not appear to have been staffed or used in line with the conceptual guidance of NUREG 0654, Rev 1, which states that, "each licensee shall establish an Emergency Operations Facility from which evaluation and coordination of all activities related to an emergency is to be carried out..." This was attributed, in part, to the licensee's conceptual use of the TSC (See Section 4.1.1.2) and organizational conflicts involving the functional areas of emergency activity assigned to the EDO, the Radiological Emergency Manager and the Recovery Manager (See Section 2.1 and 2.2). The EOF would be the location from which the licensee's corporate response organization operates to support the onsite organization. The functions of overall evaluation and coordination of emergency activities appeared to have been divided between the EDO at the TSC and the Recovery Manager and Radiological Emergency Manager at the EOF.

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

- Review of the conceptual use and staffing of the EOF in light of organizational changes which occur as a result of action on items identified in paragraphs 2.1 and 2.2 (272/81-07-20; 311/81-08-20).

4.1.1.5 Post-accident Coolant Sampling and Analysis

The auditors reviewed the licensee's implementation of NUREG-0578, paragraph 2.1.8.a, post-accident coolant sampling and analysis capabilities to verify that the licensee had the ability to sample and analyze high activity reactor coolant samples during accident situations. The auditors compared the licensee's interim reactor coolant sampling provisions with the licensee's response letter dated July 8, 1980. The auditors inspected the sampling location, reviewed the sampling procedures (see section 5.4.2.4) and discussed

the shielding design parameters with the Senior Chemistry Supervisor and other licensee representatives.

The primary coolant sample laboratory for both units was located on the 110-foot level directly above the chemistry laboratory on the Unit 1 side of the Auxiliary Building. The design review submitted by the licensee's corporate engineering staff stated that this location would be accessible during accident situations. There was an isolated off-line sampling arrangement which was shielded and provided with reach-rods for valve manipulation. A sample handling device was available. The auditors determined that provisions for reducing personnel radiation exposures were adequate. Through further discussion, the auditors noted that the interim coolant sampling system could not be used to withdraw more than one sample under accident conditions. After taking the first primary coolant sample the location would be highly contaminated with airborne radioactivity released by the required

purging the sample line and further, the bottles used to hold coolant from the flushing operation prior to sampling would be full.

The analytical laboratory appeared to have adequate instrumentation and procedural capability for evaluating the sample for hydrogen, boron and fission products.

The auditors reviewed the licensee's shielding design for the laboratory with the criteria reviewer, and determined that this location would also be accessible during accident conditions. The auditors noted, however, that additional shielding blocks and various analytical accessories, e.g., micropipettes, volume tree and gas dilution flasks were not readily available in the chemistry laboratory. These supplies would have to be acquired from the Chemistry Department's trailer prior to implementing the reactor coolant sampling procedure.

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

- Provisions for taking multiple post-accident reactor coolant samples (272/81-07-21; 311/81-08-21).

- Storage of all necessary post-accident reactor coolant sample analytical supplies in the chemistry laboratory (272/81-07-22; 311/81-08-22).

4.1.1.6 Post-accident Containment Air Sampling and Analysis

In response to guidance in NUREG-0578, installed Unit 1 and Unit 2 containment air sampling hook-up locations were modified and sample lines were extended to permit sampling under accident conditions. The auditors inspected the sampling location and determined that the post-accident containment air sampling equipment would be

accessible during accident conditions. Personnel would not have to traverse or work in areas of high radiation fields in order to obtain the sample. The design and shielding of the area equipment and sampling lines were such that radiation doses received by the user while collecting the sample would be ALARA. While the area was not monitored with installed, fixed ARMs, procedural provisions provided for area surveys and Radiation Exposure Permit (REP) preparation prior to sampling (See Section 5.4.3.1).

A portable sampling device capable of collecting particulates, iodine, and gaseous samples would be connected at the interim sampling location. Remote handling tools and portable, temporary shielding were available for use in transporting the sample.

The sample analysis facility would be accessible during accident conditions and the instruments and detectors described in the procedure were in place. The samples would be transferred to the radiation protection counting room for analysis.

Off-site facilities would also be available if the radiation protection counting room should become inaccessible.

The auditors noted that there were provisions to place temporary shielding around the sampling device. Also, the equipment necessary to assemble the portable sampling device and additional supplies, e.g., filters, survey instruments and shielded sample holders, were located in the Radiation Protection Controlled Access Area. The auditors noted that the interim sampling techniques did not appear to provide for a representative sample due to the long length and small diameter of the sample line.

The auditors noted that, at the time of the review, the extended sampling lines were not in place. Rather, the tubing was rolled-up in the electrical penetration area due to contractor crews working in the area. The sampling lines were restrung for an NRC requested walk-through (Section 7.0).

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:

- Provisions for storing post-accident containment air sampling equipment and supplies together as a readily accessible containment air sampling kit (272/81-07-23; 311/81-08-23)

- Determination of the representativeness of post-accident containment air sample collection (272/81-07-24; 311/81-08-24).

4.1.1.7 Post-accident Gaseous & Particulate Effluent Sampling and Analysis

The auditors reviewed the licensee's implementation of NUREG-0578, paragraph 2.1.8.b, post-accident sampling and analysis capabilities and high range monitoring instrumentation to verify that the licensee had the ability to sample and analyze high activity gas and particulate effluents during accident situations. The auditors compared

the licensee's interim, in-place high range effluent monitoring instrumentation with the system described in a licensee letter dated July 8, 1980. The auditors inspected installed equipment and sampling locations, reviewed sampling procedures (see 5.4.2.8) and discussed post-accident effluent sampling and monitoring with the Senior Chemistry Supervisor and Radiation Protection Engineer and other licensee representatives.

The high range effluent monitoring and sampling instrumentation described in Section 10.0 of the Emergency Plan consisted of an Xenon-133 (noble gas) monitor designated R-43, and two plant vent iodine and particulate air sampling systems.

The R-43 monitor was a G-M detector located on the roof of the Auxillary Building and positioned 150 feet from each unit's plant vent. Lead shielding of about 2 inches thickness on all sides except in front of the detector was provided to minimize the detector's response to background radiation while enabling measurement of high exposure rates from the direction of the vent

stacks of Units 1 and 2. The air volume within the main vent is shielded by one centimeter of iron and the end of the detector is shielded by a 0.5 centimeter thick iron weather cap. If the main vent is filled with effluents from the containment having fission products released from the fuel, the concentration of radioactive material in the main vent would result in a dose rate at the detector that would be a function of time after shutdown. Assuming 1% failed fuel and a two year operating history for one third of the core, after a one day decay time, the dose rate at the detector would be approximately 5 mR/hr. This radiation level was determined to be approximately equal to that which would result from the detector shield interacting with the radiation emanating from the auxiliary building or from containment. Therefore, this monitoring system would not provide useful information beyond one day. After one week, a dose rate projection based on the actual fission product inventory remaining in containment would be a factor of one hundred higher than the projected dose rate determined by using the R-43

vent monitor output. The above shortcoming relative to longer range dose rate projection would be of no consequence to the licensee's dose estimation and projection methodology during the initial 12 hours of an accident, for which this monitor was intended (see section 5.4.2).

The high range vent stack R-43 monitor readout was located in the Unit 1 Control Room and had a range of $0\text{-}10^4$ mR/hour. The monitor was capable of providing a continuous readout of vent stack exposure rates. It was noted that the high range vent stack monitor had a range that was one order of magnitude lower than the $0\text{-}10^5$ mR/hr value specified in NUREG 0578.

The locations of the vent stack sampling points for radioiodine and particulates were on the 198 foot elevation adjacent to the vent stack and at the 68 foot elevation within the electrical penetration room. Although the licensee had designated two existing sampling systems for use in drawing radioiodine and particulate effluent

samples, the auditors noted that neither of these sampling locations would be accessible during accident situations. The licensee's corporate engineering staff was aware of the accessibility limitation. The licensee's intent was to retrieve the high activity sample only when the plant vent release had appreciably reduced and it was the licensee's understanding that the method was sanctioned by the NRC Office of Nuclear Reactor Regulation. However, the licensee could produce no documentation relating to this understanding.

Based on discussions between the auditors and licensee personnel, the licensee determined that the plant vent sampling location must be accessible during an accident. Consequently, the licensee initiated immediate action to provide an extension to the vent stack sampling lines from the existing location within the penetration room. The longer sampling lines and associated tap-in-valves, similar to those provided for the containment atmosphere sample (see 4.1.1.6) were in place within 24 hours. The auditors examined the installed equipment located in the penetration

room along with the modified sampling location and noted that it afforded improved accessibility without excessive exposure to sampling personnel.

The auditors questioned the capability of the sampling system to afford a representative particulate effluent sample since it appeared that sample losses would occur within the long, small diameter sampling lines. The licensee recognized that the problem of sample representativeness would have to be addressed for their interim particulate effluent sampling method and had begun work in this regard. The auditors also noted that charcoal rather than silver zeolite was being used as the iodine collection medium. T. NRC Safety Evaluation Report (S.E.R.) dated March 21, 1981, had been issued on the basis that silver zeolite would be used.

Concerning the analytical laboratory, adequate instrumentation and procedures for evaluating collected high activity samples appeared to be available.

The auditors reviewed the facility's design and determined that the laboratory would be inhabitable during most accident situations. In the event the location would have to be evacuated, the licensee would use their off-site analytical laboratory in Maplewood, NJ.

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

- Demonstration that samples collected from the plant vent under accident conditions, when normal monitoring instrumentation is off-scale or out-of-service, will be representative (272/81-07-25; 311/81-08-25).

4.1.1.8 Post-accident Liquid Effluent Sampling and Analysis

The auditors reviewed the licensee's post-accident liquid effluent sampling and analysis facilities to verify that the licensee could effectively sample and analyze high activity liquid effluents

during an accident situation. The auditors inspected installed equipment, reviewed the sampling procedures (see 5.4.2.10) and discussed the post-accident sampling and analysis equipment with the Senior Chemistry Supervisor.

The licensee's installed liquid processing system consisted of tanks and equipment for collecting, transferring, treating, monitoring, and releasing radioactive liquids. Post-accident radioactive liquid releases would be made on a batch basis from the chemical volume control storage (CVCS) monitor tanks or for smaller volumes, from one of three waste monitor tanks. Two sets of liquid effluent tanks were located on the 64 foot elevation of the Auxiliary Building for Units 1 and 2. The area was monitored for gamma dose rates and the liquid effluent sampling pumps were in continuous operation for routine sampling.

The licensee also stated that these locations would be accessible during accident conditions. However, if the dose rates would result in

excessive personnel exposure, the liquid effluents could be transferred to one of three large volume waste holdup monitor tanks and a shielding wall encasing the holdup tanks would permit access to the sampling system. An area dose rate meter was located at this secondary sampling point. The analytical laboratory had a multi-channel analyzer for which calibration procedures were performed three times daily.

The auditors determined that the post-accident liquid effluent sampling locations appeared to be adequate for and accessible during accident conditions and that the analytical laboratory appeared to have adequate instrumentation and procedures for evaluating all samples collected. The licensee's analytical facilities appeared to be inhabitable during accident situations, and a back-up offsite analytical facility would be available at Maplewood, New Jersey.

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

4.1.1.9 Offsite Laboratory Facilities

On the basis of conversations with members of the site and corporate staffs, it was determined that the licensee had adequate provisions for offsite laboratory facilities. The licensee's Energy Laboratory at Maplewood, NJ, RMC and Ichthylogical Associates (IA) would provide backup laboratory facilities and instrumentation for offsite monitoring and analysis, on both short and long term bases. The licensee had contracts with RMC and IA for monitoring and analytical support.

There was a van equipped with monitoring and analytical capability available. The instrumentation appeared to be properly maintained, calibrated, routinely checked and repaired or replaced promptly. It was also confirmed that additional monitoring instruments were on order for use in the van and at the Maplewood Laboratory.

Since the offsite laboratories were not visited, no specific findings relating to their capabilities are reported. However, on the basis of the

findings related to the van and prior knowledge of the offsite laboratory capabilities and facilities, this portion of the licensee's program appears to be acceptable.

4.1.2 Protective Facilities

4.1.2.1 Assembly/Reassembly Areas

The Emergency Plan Manual Implementing Procedures identified the following five specific accountability stations (assembly areas):

-- Control Point (Service Building, 100'-Elevation - Main Control Point)

-- Cafeteria

-- OSC (Corridor between Control Rooms)

-- Administration Building Main Office

-- Catalytic Construction Area

The auditors toured all the areas except the Administration Building and "A" Building Control Point. The OSC is described in Section 4.1.1.3 of this report. The Service Building Control Point was located in the area used by the plant radiation protection group. The personnel required to assemble at this location process through the area each shift to gain access to the control area. The auditors confirmed the equipment inventory for the Service Building Control Point which included high and low range survey instruments, high and low range dosimeters, TLD, an air sampler, portable lights, anti-contamination clothing, and respirators. This assembly area was also located in close proximity to the decontamination facility. Scott air packs were also available in the area but did not appear on the equipment inventory for the "Main Control Point" in the emergency procedures.

The plant cafeteria was located approximately 300 feet from the two containments. It provided sufficent area (1800 sq ft) for the approximately two hundred day shift personnel expected. Communications with the TSC, Control Room, and

Guard House were provided by one plant page and one phone. The cafeteria was not provided with protective clothing, portable lighting or monitors to determine habitability. Plant management stated that habitability of this facility will be determined by in-plant survey teams. The auditors noted, however, that these provisions were not clearly reflected in the emergency procedures (See Section 5.4.2.3). The auditors participated in a plant accountability drill, during which the auditors reported to the cafeteria. The auditors noted that there was adequate space for the personnel assigned to that area for accountability and that radiation monitoring of the area took place.

The Catalytic personnel assembly area was located approximately 1200 feet from the reactor in a building having approximately 3000 square feet. This area will provide adequate space for the approximately 300 Catalytic personnel on the day shift. Communications were available by telephone.

The auditors noted that Emergency Procedure EPI-12 "Site Evacuation", specified that personnel evacuating the plant would "proceed to the end of the access road near the Lower Alloways Creek warning horn for further instructions". This area was inspected and did not appear to provide sufficient space for the number of cars that would be expected to leave the site without blocking the only ingress/ egress route for the Salem and Hope Creek sites.

The auditors held discussions with Hope Creek personnel who stated that, if an evacuation were required, personnel would be monitored and, if found contaminated, they would be told to go home and "take a shower". There were, consequently, no clear provisions for an offsite assembly area for Hope Creek personnel.

The Emergency Plan Manual Implementation Procedures also stated that the EDO would specify the reassembly area to be used by emergency personnel recalled to the site if access to the site were restricted by radiological conditions; however, the procedures did not indicate how personnel

responding to the site would be informed of the location of this reassembly area or how the reassembly area would be selected or provide candidate locations from which to choose.

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

- Designation of assembly/reassembly areas for individuals who may be evacuated from the Salem and Hope Creek sites and/or recalled to augment the onsite response organization (272/81-07-26; 311/81-08-26).

4.1.2.2 Medical Treatment Facilities

The licensee maintained onsite provisions and facilities located in the Administration Building for the treatment of individuals who may be injured and contaminated. Consequently, all persons who may be injured or contaminated and will be treated onsite must be transported to the Administration Building first aid area.

The first aid room in the administrative area was maintained under electronic lock. There were, however, provisions for rapid entry using a key-card which would permit immediate access. Easy access by two individuals carrying a stretcher would be possible. The facility was equipped with first aid equipment and supplies adequate to perform limited personnel decontamination. Communications were available from the first aid facility and procedures for treatment and decontamination of individuals were available.

Backup support for the treatment of injured and contaminated individuals was available from the Salem County Memorial Hospital and Radiation Management Corporation (See Section 6.1 for further details).

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

4.1.2.3 Decontamination Facilities

There were provisions for limited decontamination of personnel in the onsite medical treatment facility discussed above. These provisions consisted of a body tray for wash down of an individual, large carboys for the collection of potentially contaminated water, cotton swabs and various other decontamination supplies. A source of water was available at a deep sink located in the facility. There were provisions for the disposal of solid and liquid waste at the first aid/decontamination facility. Other provisions for decontamination at the Salem site were the showers normally used by individuals who work in the controlled area. There were, however, no provisions for decontamination of personnel or vehicles/equipment that may be evacuated from the Salem or Hope Creek Sites in the event of an emergency. (See section 4.1.2.1 for related details).

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

- Provision of supplies and equipment for decontaminating persons and vehicles which may be evacuated from the Salem and Hope Creek sites or from other locations known or suspected to be contaminated (272/81-07-27; 311/81-08-27).

4.1.3 Expanded Support Facilities

The Emergency Plan and Recovery Manual specified that the EOF would serve as the command center for implementation of the Recovery Organization. As stated in section 2.2, the Recovery Organization would be headed by the Recovery Manager, who would be responsible for providing assistance, as necessary, to the EDO. Section 4.0 of the Emergency Plan identified the Institute for Nuclear Power Operation (INPO) Westinghouse (NSSS), the Pennsylvania - Jersey - Maryland (PJM) Power Pool, (consisting of eleven utilities and five operational nuclear power stations), and Porter Consultants as primary sources of non-licensee technical support. As noted in section 2.2 of this report, the

licensee had not designated where the above personnel and equipment resources would interface or be assimilated into the licensee organization. Discussions with licensee management indicated that work facilities would be determined on an as needed basis.

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

- Specification of the expanded support facilities or general work locations to be used by expanded support personnel (272/81-07-28; 311/81-08-28).

4.1.4 News Center

The PSE&G Emergency Public Information Program, prepared by the Information Services Department and revised March 23, 1981 established an offsite news center located in the American Legion Building in Salem, N.J. Tour of the facility and discussions with licensee personnel indicated that there were provisions for approximately 40 telephone lines, power for added TV equipment, visual aids such as

models for press briefing and that a duplicating machine would be provided. The interview indicated that security would be provided for this facility by the Hope Creek security force.

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

4.2 Emergency Equipment

4.2.1 Assessment Equipment

4.2.1.1 Emergency Kits and Emergency Survey Instrumentation

The licensee had stocks of emergency supplies and survey instruments prepositioned at various locations throughout the facility. The locations and equipment were as specified in the Emergency Plan, Section 9.0, Emergency Facilities and Equipment and Table 1 of EP II-13, Conducting an Inventory of Emergency Equipment.

The auditors reviewed and inventoried all emergency kits at their assigned locations and found them to be complete except for a SAM 2 missing from TSC storage cabinet. A review of available portable survey instrumentation indicated that their ranges, types and numbers appeared adequate to meet anticipated emergency needs as outlined in the procedures. Instrumentation available for individuals or teams reentering the facility provided the capability to detect and measure radiation fields up to 1000 R/hr.

Emergency environmental sampling and sample counting equipment provided a capability to detect and measure radioactive concentrations in air with a sensitivity of an least 1E-09 uCi/cc under field conditions. The counting instrument was the Eberline Stablized Assay Meter (SAM-2) in conjuction with the RD-19 sodium iodide detector. The licensee had three such units on hand and each was calibrated. The air sampler used was the RADECO H890V. Charcoal and silver zeolite cartridges were available as the collection media. Operability checks and inventories appeared to have been routinely performed on all

emergency instrumentation, supplies and equipment described in the Emergency Plan and implementing procedures. The inventories and checks performed appeared to have been adequate to maintain emergency supplies and equipment in a constant state of readiness.

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

4.2.1.2 Area and Process Radiation Monitors

The area and process radiation monitors described in the Emergency Plan were available and operable for use in emergency detection and classification of emergency events. The readouts and recorders were located in an area behind the reactor control panels. Trip settings were logged in the emergency procedure and when exceeded, an annunciator trips at the control panel and the procedure requires verification of the response by looking at the meter involved. The operator then recorded and reported the upscale response to the Shift Foreman or Supervisor.

The area radiation monitor detectors were placed at locations to sense the radiation levels in the area of coverage. The containment dome monitor has been unchanged since the finding of the Health Physics Appraisal. That finding was that it was deemed inadequate to perform in the atmosphere in containment during a loss of coolant accident. All monitors would be affected by elevated radiation background resulting from fission gases in the surrounding containment air. A two point calibration was used. Cs-137 was used for area monitors and Ba-133 for iodine monitors. No standard that represented a source deposited on the filter media was used. Calibration of air monitors were accomplished using point sources on a disc holder. Conversion factors for the readout of all radiation detection instruments were provided by radiation chemistry and radiation protection engineers. Conversion factors were used to calculate concentrations in uCi/cc or dose rates in Roentgens/hr. The locations and types of monitors were similar for Unit 1 and Unit 2. The readouts are located where they are readily accessible in the control room areas.

A preventive maintenance program services each radiation detector system on a 28-day schedule. When failures occur, the failure was logged and the instrumentation was repaired promptly and resolution was checked by a follow-up procedure. Operability and calibration checks were performed independently of instrument maintenance by radiation protection or radiation chemistry on a quarterly schedule. These checks appeared to be adequate.

Failed instruments were promptly replaced with spares from inventory and repaired for future use. Written procedures existed for the calibration of all types of radiation detection systems. Redundant power sources were available. Unit 2 experienced switch-over problems resulting in loss of some of their instrumentation when the TSC computer was activated (See Sections 4.1.1.2 and 4.1.1.1). The licensee had provided interim instrumentation to meet NUREG 0578 guidance for dose projection (see sections 4.1.1.5 through 4.1.1.8).

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

4.2.1.3 Non-radiation Process Monitors

The non-radiation process monitors described in Tables V-1 through V-4 of the Emergency Plan and procedures as being relied upon for emergency detection, classification, and assessment were in-place and operable. All monitor readouts were either in the control room or in the proper rack room directly behind the control room. Readouts were readily observable.

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

4.2.1.4 Meteorological Instrumentation

The basis for the auditor's review of the licensee's meteorological measurements program included Regulatory Guides 1.23 and 1.97, and the criteria contained in NUREGs -0654, -0696, and -0737.

The licensee outlined a description of the meteorological measurements program in Section 9.2.3 of the Emergency Plan and in Section 2.3.3 of the FSAR. The integration of meteorological information into the licensee's dose assessment scheme was described in Procedure EPI-10 A & B. The auditors reviewed the licensee's preventative maintenance program (prepared by Meteorological Evaluation Services /J. Healy), data reduction program, calibration records and site logs for current and past activities.

The auditors determined that the licensee's meteorological capabilities met the guidance of Appendix 2 to NUREG-0654, Rev. 1, by adopting the alternative to milestone 3. The licensee could not, however, substantiate that the data from the alternate source of meteorological information (Greater Wilmington Airport) would characterize site conditions. Although this source was close to the SNGS and was a National Weather Service station, the licensee had not provided a sufficient basis for its use in the "bay breeze" environment which exists in the

site vicinity. Meteorological information from the primary system was displayed in the control room on strip chart recorders that were readily accessible. The information displayed in the control room and in a trailer near the meteorological tower was routinely checked on a shift and (at least) weekly basis. A quarterly calibration schedule was established. The licensee had made provisions for prompt restoration of inoperable equipment. The auditors noted, however, that the licensee did not have equipment installed that could monitor reports and inform the licensee of severe weather warnings or watches in the site vicinity; e.g., NOAA weather radio.

Based on the findings in the above area, this portion of the licensee's program appeared to be acceptable, however, the following matters should be considered for improvement:

- Verification that the data obtained from the alternate meteorological data source is applicable to the "bay breeze" environment (272/81-07-29; 311/81-08-29); and

- Implementation of provisions for informing shift operations personnel of severe weather warnings or watches in the site vicinity (272/81-07-30; 311/81-08-30).

4.2.2 Protective Equipment

4.2.2.1 Respiratory Protection

Self-contained breathing devices were reserved at various locations for emergency use. There was a respiratory protection equipment maintenance and decontamination area and a plan/procedures for repair and decontamination of respiratory protection units. There were a portable diesel generator and compressor in the Fuel Handling Annex Building for refilling SCBA devices. This unit may be moved in case of contamination or high radiation levels. The licensee estimated that there would be a six to eight hour turnaround on refilling of all tanks onsite. Sixty spare, filled tanks were available at controlled access points.

There was a written Respiratory Protection Program provided in the Radiation Protection Manual. All personnel who may be required to use respiratory protective equipment and supervisors received preparation and training in the proper use. The Radiation Protection Equipment Group and the Dosimetry Group maintained records on these units.

Based on the above findings, this portion of the licensees program appeared to be acceptable.

4.2.2.2 Protective Clothing

There were no stores of protective clothing specifically set aside for emergency use. There were, however, approximately 4,000 sets available throughout the site at the two change facilities and two control points. In addition, there were 1,000 sets stored in the warehouse. Under emergency conditions these routine stores would provide sufficient protective clothing.

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

4.2.3 Emergency Communications Equipment

The communications equipment specified in the licensee's Emergency Plan and Implementing Procedures was available. There were specific alarms throughout the facility which had specific emergency meanings, and these were discussed as part of the general employee indoctrination training requirement. These alarms were: the fire alarm; the Cardox/Halon alarm; the containment building or fuel handling building evacuation alarm; and the radiation alert alarm. In areas where aural alarms would be inaudible because of high noise levels, visual alarms, in the form of rotating red beacons, were provided.

A problem with electrical arc welding operations causing spurious activation of containment and fuel handling building evacuation alarms was noted during the 1980 Health Physics appraisal. The auditor held discussions with licensee personnel and determined that the item has been resolved.

Voice communications equipment consisted of multi-channel portable radios, multi-channel fixed station radios, a NAWAS connection, New Jersey State Police radio, and dedicated telephone lines to local emergency response organizations. Backup systems of key communication nets existed in the form of radios, dedicated telephones, and beepers. In addition to the licensee's communication systems and devices, telephone sets from two separate NRC nets were at strategic locations throughout the facility. One net was the ENS (Emergency Notification System) which is to be used for rapid notification of the NRC in the event of an emergency and for the subsequent transmission of operational data. The second net, the HPN (Health Physics Network) is to be used by the NRC for the transmission of health physics and environmental monitoring data. The alarm systems, all installed radio systems, and plant page were powered by a redundant power system.

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

4.2.4 Repair/Corrective Action Equipment

The licensee did not maintain reserves of equipment for damage control, corrective actions, and/or emergency

maintenance of equipment. Rather, the Emergency Plan relies upon the availability of the routine stocks of instrumentation and equipment. Sections 2.1 and 5.4.5 of this report described organizational and procedural discrepancies involving the licensee's failure to implement clearly defined organizational and procedural provisions for repair and corrective actions. As a result, the auditors determined that equipment needs to support such activities had not been adequately evaluated by the licensee.

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

- Evaluation of the equipment needs for supporting repair and corrective action teams and positioning of this equipment at specified locations for use by the teams (272/81-07-31; 311/81-08-31).

4.2.5 Reserve Emergency Supplies and Equipment

For a serious emergency, the licensee relies on the normal inventory of supplies (e.g., survey instruments, dosimetry for the environmental radiation monitoring program, protective clothing and equipment, and other instruments and equipment) to support augmented emergency operations and

supplement the emergency reserves. The licensee had established invertory controls to include minimum and maximum stock levels.

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

4.2.6 Transportation

The licensee had six vehicles specifically dedicated to emergency response operations. These included one emergency survey van with radiation monitoring equipment and a medical stretcher. A second van was dedicated as a site ambulance and equipped as such. Both vehicles had radio communications with the site. Four vehicles (sedans) were assigned to EDOs on a full-time basis. These vehicles had both radio and radio telephone communication systems installed. Keys for the emergency vans were controlled by the Administrative Branch and Security and were readily available. Keys for the four sedans were controlled by the assigned EDOs and by the Administrative Branch.

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

5.0 PROCEDURES

5.1 General Content and Format

Procedures to implement the Emergency Plan were developed by various elements of the PSE&G organization. The range of procedures consisted of Emergency Procedures (EPs), Radiation Protection Instructions (PD Series 15), Recovery Management Manual Implementing Procedures (untitled and unnumbered), Emergency Instruction (EIs) and Administrative Procedures (APs). The nature and scope of the procedure form and content varied considerably. In general, procedures lacked guidelines or references for areas in which the user of the procedure would be permitted to exercise judgement. The procedures developed to implement the Recovery Manual were general in nature and did not have form or content characteristic of procedures. Many of the emergency tasks performed by the Recovery Management Organization, such as environmental monitoring, notification of offsite agencies, etc., were not covered by procedure or reference to procedures. The specific findings in relation to the range of procedures developed to implement the Emergency Plan are discussed in subsequent paragraphs.

5.2 Emergency, Alarm and Abnormal Occurrence Procedures

At SNGS the term Emergency Instruction is used to designate those procedures used by the operating staff to identify and classify

abnormal plant conditions and to initiate actions to return the plant to normal or stable conditions. These Emergency Instructions at SNGS include emergency, abnormal and alarm condition procedures. The auditors reviewed the Emergency Instructions and noted that only two of twenty-four Unit 1 Emergency Instructions referred the control room staff to the Emergency Procedures. Walk-throughs and discussions with several EDO-qualified personnel indicated that the lack of a reference to Emergency Procedures in the Emergency Instructions made event classification difficult. For example, EI I-4.4, LOCA, did not refer the control room staff to the Emergency Procedures, yet several plant indications in this instruction were EALs established by the licensee for declaring a General Emergency in accordance with EP I-4. A walk-through using this Emergency Instruction demonstrated that the EDO-qualified individuals (Senior Shift Supervisors) initially present on-shift were not certain when the EALs decribed in the Emergency Procedures were met or when the EPs were to be implemented.

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

- Revision of the Unit 1 and Unit 2 emergency, abnormal and alarm condition procedures to include instructions for classifying emergency/abnormal situations and implementing the appropriate

SNGS Emergency Plan Emergency Procedures to ensure prompt detection, classification and initiation of emergency response actions (272/81-07-32; 311/81-08-32).

5.3 Emergency Plan Implementing Instructions

The auditors reviewed Emergency Procedures EP I-1, EP I-2, EP I-3 and EPI-4 which constituted the implementing instructions for responses to unusual events, alerts, site and general emergencies. These procedures did not clearly specify the individual responsible for their implementation. The Emergency Action Levels (EALs) specified in these procedures were not clearly defined in terms of site specific control room instruments and readings nor were they the same EALs as those contained in Tables V-1 through V-4 of the Emergency Plan. Walk-throughs and discussions with EDO-qualified personnel indicated that the lack of specific EALs tied to plant instrumentation or a reference to the appropriate Emergency Procedure in the Emergency Instructions made it difficult to detect and classify the events in a timely manner (See Section 5.2). These individuals expressed the concern that the EALs in the EPs required the plant personnel to make value judgements beyond their level of understanding and that the value judgment could be incorrect and result in delayed or misclassification. Further discussions indicated that plant operations personnel had not been included in the development or review of the EALs contained in EPI-1 through EP I-4.

Emergency Procedures EP I-3, Site Emergency, and EP I-4, General Emergency, indicated that EP I-12, Site Evacuation, was to be implemented if evacuation of the site is required, but failed to indicate how the need for site evacuation would be determined or specify the action levels which would result in evacuation. Emergency Procedures EP I-3 and EP I-4 also required completion of a "Recommended Protective Action Worksheet" but failed to provide instructions or references to the user to other procedures describing how or on what basis protective action decisions and recommendations were to be made. The auditors noted that Radiation Protection Instructions, PD 15.12.212, PAG Initiation, and PD 15.12.312, PAG Instructions, provided instructions for protective action decisions based on EPA PAGs, but they were not referenced in Emergency Procedures EP I-3 and EP I-4, nor were they available in the control room. PD 15.12.212 referenced EP I-4 and EP I-5,however, the reference to EP I-5, Personnel Emergency, was incorrect.

Emergency Procedures EP I-1 through EP I-4 did not specify those functions and responsibilities assigned to the Emergency Duty Officer (emergency coordinator) which may not be delegated and failed to clearly indicate who was responsible for initial protective action notifications to offsite agencies. The auditors noted that NUREG-0654, item B.2, specifies that such actions are to be performed by the emergency coordinator (EDO).

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

- Review of the Emergency Action Levels contained in the SNGS Emergency Plan Implementing Procedures and, as necessary, their revision to provide clear, readily observable, site-specific indications that EALs have been reached or exceeded, and the interface of these EALs, as appropriate, with the emergency, abnormal and alarm condition procedures (272/81-07-33; 311/81-08-33).

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

- Revision of EP I-1, EP I-2, EP I-3, EP I-4 to include references to other procedures which implement the response appropriate for the emergency class which has been declared, specification of the individual in the emergency organization who is responsible for implementing the procedures and the responsibilities which the EDO cannot delegate (272/81-07-34; 311/81-08-34).

5.4 Emergency Plan Implementing Procedures

5.4.1 Notifications

Emergency Procedure, EP I-1, Notification of Unusual Event, specified the notification process to be followed for events classified in the Unusual Event category. The procedure contained a contact log with a pre-planned message and contact listing.

Emergency Procedures EP I-2, EP I-3, and EP I-4 for Alert, Site Emergency and General Emergency Categories, respectively, initiate notifications of the Emergency Duty Officer, Nuclear Regulatory Commission, Plant Manager, Chief Engineer, State of New Jersey, Salem County, Delaware State Police, Station Security, the Visitor's Center and Hope Creek construction site. The procedures contained contact logs and pre-planned messages. The auditors noted that the aforelisted procedures, however, did not contain provisions for notification of the Department of Energy nor the NRC resident inspector.

Emergency Procedure EP I-4, General Emergency, provided for direct notification of the counties within the plume exposure EPZ.

The Operations Support Center is manned and activated by onsite personnel in response to notification by a PA announcement made by control room personnel. The announcement

content was contained within the appropriate procedures. The procedures also specified that operations personnel are to report to the OSC when the Radiation Alert Alarm is sounded.

The Technical Support Center is initially manned by the Shift Technician-Nuclear in response to the PA announcement or Radiation Alert Alarm. Call in of members of the radiation protection group during backshifts and weekends, is performed by the Shift Technician-Nuclear in accordance with Procedure PD 15.12.101, Initial TSC Response Guide. This procedure also stated that the user should "consider obtaining additional personnel assigned to other departments (i.e., Chemistry, I&C, Maintenance and Administration)," but provided no call lists nor names of people to be contacted. Discussions with station personnel indicated that the call lists within the corporate Recovery Manual would be used by station management to notify other personnel required to man the TSC; however, this was not reflected in the Emergency Procedures. The licensee stated that a revision to the Emergency Procedures which would include the TSC call-out list was under preparation.

Activation of the EOF and Recovery Management Plan was stated to be the responsibility of the Plant Manager or his designee. This was only reflected in EP I-2 and did not indicate who should be contacted or how. Section 11 of the Recovery Manual specified the procedure for activation of the EOF by corporate support personnel, but only contained call lists for the individuals who would fill management positions in the recovery organization.

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

- Development and implementation of procedures for activation of the EOF and call-in of all licensee personnel having emergency duties and responsibilities down to the working level (272/81-07-35; 311/81-08-35).

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

- Inclusion of all phone numbers or a clear reference to them in the appropriate notification procedure (272/81-07-36; 311/81-08-36).

- Revision of EPs I-2, I-3, and I-4 to provide for notification of the NRC resident inspector (272/81-07-37; 311/81-08-37).

- Provisions for immediate activiation of the TSC during the day-shift in response to the PA announcement or Radiation Alert Alarm (272/81-07-38; 311/81-08-38).

5.4.2 Assessment Actions

The auditors reviewed the licensee's procedures for collecting data to assess accident consequences and the bases of recommendations for onsite and offsite protective actions. The auditors noted that there was no overall procedure which orchestrated the implementation of the licensee's accident assessment scheme (operational and radiological) for gathering information and data upon which to escalate, de-escalate, take corrective actions or recommend protective actions onsite and offsite.

Assessment action procedures for performing dose projections were:

EP I-10, Emergency Dose Calculations
PD 15.12.312, PAG Instructions
PD 15.12.317, Release Rate Determination From Unmonitored Steam Release Points

PD 15.12.318, Unit I Effluent Dose Calculations
PD 15.12.319, Unit II Effluent Dose Calculations
PD 15.12.320, Computerized Dose Calculations

The auditors reviewed these procedures for clarity, completeness, reviews, and approvals. Discussions with licensee personnel indicated that the aforelisted procedures would be used initially by the onsite emergency organization and subsequently by EOF personnel. The individual assessment procedures, however, were only written from the viewpoint of the onsite emergency organization and user. The auditors also noted that these procedures were not referenced in the Recovery Management Manual. The procedures had been reviewed by the Quality Assurance Department, the Station Operating Review Committee (SORC), and approved by Performance Engineering and the Station Manager.

The auditors noted that the procedures did not integrate all aspects of assessment actions to allow dose projections to be based on plant parameters, meteorology, plant chemistry and field survey information, and failed to identify a priority system for assessment actions. The procedures generally identified sources and types of required information.

Action levels and protective action guides, that would be used by assessment personnel as a basis for considering or recommending the initiation of emergency measures to terminate or mitigate the actual or projected consequences determined from the assessment process were specified. There did not, however, appear to be provisions within the dose assessment procedures to insure that trend analyses are performed, nor for recommending protective actions based on plant conditions. There was a means, based on installed control room instrumentation, for initially projecting exposures or exposure rates to the whole body and thyroids of individuals located within the plume exposure Emergency Planning Zone (EPZ) and to personnel onsite. Provisions were made in the procedure for the notification of offsite agencies if the offsite dose projections indicated dose levels to the public in excess of the lower limits of the Protective Action Guide (PAG) established by the Environmental Protection Agency (EPA).

There were provisions for determining the containment source term based on containment release rates using the containment monitor and containment air sampling. A default set of values were provided for making initial dose projections in the event installed control room

instrumentation should be offscale or inoperable. The licensee's provisions for dose assessment were based on hand calculations, computer and portable calculator programs, and field measurements. The auditors noted during walk-throughs that the "hand" calculation method was time consuming and complex (See Section 7.2.3).

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

- Development of Protective Action Guides and procedural revisions for protective action recommendations onsite and offsite based on plant conditions (272/81-07-39; 311/81-08-39).

In addition to the above, the following improvements should be considered:

- Development of procedural methods to integrate and coordinate all assessment actions and establish a priority system for gathering assessment data (272/81-07-40; 311/81-08-40).

- Review of existing dose assessment procedures with the intent of streamlining the content to enhance the timeliness of projections made without using the dose computer (272/81-07-41; 311/81-08-41).

Additional procedures involving specific tasks related to the assessment process are discussed in subsequent paragraphs.

5 4.2.1 Offsite Radiological Surveys

The auditors reviewed Part 10 of the Emergency Plan and Procedure PD. 15.12.315 to evaluate the licensee's procedural provisions for offsite radiological surveys. Discussions with licensee personnel indicated that this procedure would be used initially by the onsite emergency organization and subsequently by EOF personnel. The procedure was, however, only written from the viewpoint of the onsite emergency organization and user. The methods, equipment, and the pre-planned survey points for emergency offsite radiological surveys were specified. The procedure contained a form

for team members to record data and information gathered during offsite surveys, but the form did not contain provisions for recording background radiation levels which may be present at the time of air sample analysis.

The auditors noted that there were provisions for labeling each environmental sample for later identification and for orally transmitting collected data to the organizational element responsible for the raciological assessment functions. A central collection point had not been established for the return of environmental samples collected by the offsite survey teams. The locations of emergency van key was noted to be improperly stated in Procedure PD 15.12.315 as being in the Administrative Office and TSC. In actuality, the storage locations were in the Administrative Office and the Security Office. In addition, the Hancocks Bridge Municipal Building was designated as one of four sites where necessary emergency equipment for offsite monitoring could be obtained. In actuality, equipment was stored at the Quinton Training Center, Emergency Operations Facility (EOF).

The primary means of communications with offsite teams was specified to be portable radio. Backup means, should radio failure occur, was stated to be the telephone. Telephone numbers of the TSC, Control Room and Control Point were included as part of Communications Section of the procedure. The EOF numbers were not included. Initial response for offsite monitoring would be provided by on-shift health physics technicians. Upon arrival of corporate health physics personnel at the EOF, site health physics personnel would return to the site for re-assignment.

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:

- Review of Procedure PD 15.12.315 and updating, as required, to correct inaccurate information (272/81-07-41; 311/81-08-41).

5.4.2.2 Onsite (Out-of-plant) Radiological Surveys

Procedure PD 15.12.315 was also used to perform emergency onsite, out-of-plant radiological surveys. Preplanned survey points and routes were specified, however, these points were not in accordance with the actual locations. The procedure was written from the viewpoint of the person who would be required to perform the actual survey. The Emergency Survey Log of Procedure PD 15.12.315 provided a means for team members to record the date and time of each survey; the location of each survey; the names of the individual team members; the instrument used, by type and serial number; the mode in which the instrument was used, i.e., window open or window closed; the duration of the meter reading; air sampler flow rates; and sample count time. No provision was made, however, for measuring and recording background radiation that may be present at the time of sample analysis.

Each collected environmental sample is to be labeled for later identification using envelopes provided in the emergency survey kits. The

means by which collected data, including the original data sheets, are provided to the organizational element responsible for emergency assessment functions, was not specified. The survey information is collected by the field survey teams and transmitted to the EOF after it is activated. Prior to the activation of the EOF, the information from the survey teams is transmitted directly to the Technical Support Center (TSC). The procedure did not address the information flow from field survey teams through the EOF to the TSC, nor the flow of data sheets after the EOF is activated. After the EOF is activated, there is a central collection point for samples and data.

Communication methods to be used and the backup means were described. Provisions for transportation of the survey teams were defined, assigned, and controlled for emergency use. No radiation protection guidance was included for field survey teams in Procedure PD 15.12.315.

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:

- Review of Procedure PD 15.12.315 and updating, as required, to (272/81-07-42; 311/81-08-42):

  a. Provide radiation protection guidance for the survey teams;

  b. Specify the disposition of samples and the flow of information from the field survey teams to the Technical Support Center (TSC) and Emergency Operations Facility (EOF); and

  c. Denote existing onsite survey points.

5.4.2.3 In-plant Radiological Surveys

The auditors reviewed available procedures and held discussions with radiation protection personnel to evaluate the licensee's provisions

for performing in-plant radiological surveys under emergency conditions. The auditors noted that there were no special procedures developed for emergency conditions, but rather the procedures used during routine operations were relied upon.

Gamma dose rate surveys would be performed using Procedure PD 15.4.004, Radiation Survey, Gamma Dose Rate, Rev. 4. Beta dose rate surveys would be performed using Procedure PD 15.4.015, Beta Dose Rate Determination and air sampling for particulates and radioiodine using Procedures PD 15.4.008 thru PD 15.4.010. Contamination surveys using survey meters and wipe tests would be performed using Procedures PD 15.4002 and PD 15.4.003.

The auditors noted that since these procedures were written for use during normal operation, they did not reflect appropriate cautions and precautions, or prerequisites that would be necessary for use of the procedures during emergency conditions. The auditors held

discussions with licensee representatives concerning the absence of radiation protection related precautions for emergency surveys of areas with possible unknown radiation levels. The individuals stated that the radiation protection staff would review this aspect during the emergency before the survey was performed. The auditors also noted that since the survey procedures were "routine-operation" oriented they failed to consider the effects of changing nuclide compositions and those effects on instrument response.

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:

- Addressing within the routine health physics procedures, of special precautions or prerequisites that would be necessary for use of the procedures for surveys during emergency conditions (272/81-07-43; 311/81-08-43).

5.4.2.4 Post-accident Primary Coolant Sampling

Section No. 2.1.8.a of NUREG-0578 specifies that licensees should be capable of sampling the primary reactor coolant water within one hour under accident conditions without incurring a radiation exposure to any individual in excess of 3 rems to the whole body or 18 3/4 rems to the extremities. The auditors reviewed available procedures and held discussions with the Senior Chemistry Supervisor and other licensee personnel to evaluate the licensee's conformance with NUREG-0578 guidance.

Primary coolant sampling would be performed using Procedure PD 3.5.071, Interim Post-accident Sampling, Rev 3. A detailed checklist for operation of emergency sampling equipment, schematics of the sampling location, sampling equipment and sample holder were also included in the procedure.

Precautions to be observed in taking and handling an extremely radioactive primary coolant sample were addressed. Special equipment, such as high

range survey meters, protective clothing and dosimetry were listed as prerequistes, but the type and amounts were not listed. The licensee stated that a Radiation Exposure Permit (REP) prepared prior to the sampling would supply the details of these prerequisites. The REP would also designates a dose rate cutoff and any dose rate above this cutoff would cause the sampling task to be aborted. Throughout the sampling, health physics technicians would survey the area for both gamma dose rate and airborne particulates. The auditors noted that the procedure contained no guidance concerning the duration of the air sampling nor the location of the sampler. The licensee stated that this information would be listed on the REP and be discussed during the pre-task briefing.

During two walk-throughs (see 7.0) it took the licensee between 4 and 5 hours to sample the primary coolant. The sampling procedure itself took less than half an hour, with the other time devoted to writing the REP and briefing sessions.

The auditors noted a variety of other possible problems with the procedure. The sampling team, while wearing SCBA, is required to call the control room twice from the primary coolant lab. It appeared that communicating while wearing a full face mask could be a problem, causing the sampling lines to be opened at the wrong time. Also, the procedure did specify provisions for labeling the sample for later identification. Procedural information was adequate to describe the method for transporting the sample to the chemistry analysis laboratory.

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:

- Reduction of time necessary to secure a primary coolant sample (272/81-07-44; 311/81-08-44).

- Methods of communication between primary coolant sampling teams and control room operators (272/81-07-45; 311/81-08-45).

5.4.2.5 Post-accident Primary Coolant Analysis

Section No. 2.1.8.a of NUREG-0578 specifies that licensees are to perform a boron, chloride, and gamma spectral analysis of a highly radioactive primary coolant sample within two hours after collecting a sample. The auditors reviewed available procedures and held discussions with the Senior Chemistry Supervisor and other licensee personnel to evaluate the licensee's conformance with NUREG-0578 guidance.

Primary coolant sample analysis would be performed using Procedure PD 3.5.017, Interim Post-accident Sampling, Rev. 3. A two member team would be assigned to perform the analysis and radiation protection surveys. The procedure cautioned these individuals concerning the possibility of an extremely radioactive primary coolant sample, with an unshielded dose rate from the diluted

sample of 1350 R/hr at 1 cm, 356 mR/hr at two feet cited as the worse case. During walk-throughs (see 7.0) the team was properly outfitted with SCBA, protective clothing, high range dosimeters and extremity badges although the procedure did not specify the type of protective equipment required. The auditors noted that the pre-work REP described this pertinent information.

Prerequisites to sampling included preparing the fume hood with a lead shield and necessary equipment, e.g., micropipetter, dilution flasks, etc., and preparing the test reagents. After discussions with the auditors, a checklist was devised to ensure all necessary supplies would be in place.

The procedure described methods for diluting both gas and liquid phases of high level samples, and easy to read instructions for hydrogen, chloride, boron and isotopic liquid analyses. The licensee stated that the methodology of this procedure was the same as for the routine daily chemical analytical procedures. Data sheets

were provided and all data sheets would be given to the Senior Chemistry Supervisor.

The auditors noted that in the event of high background radiation levels in the counting room, no alternate counting facility was designated in the procedure. Also, the practice of wrapping the high activity counting vial in plastic was used to prevent contamination of the counting equipment.

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:

- Listing of the required respirator type, protective clothing and personnel dosimetry within the procedures governing primary coolant sample analysis (272/81-07-46; 311/81-08-46).

- Provisions for an alternate counting facility within the procedure governing primary coolant sample analysis (272/81-07-47; 311/81-08-47).

5.4.2.6 Post-accident Containment Air Sampling

Section 2.1.8.a of NUREG-0578 specifies that licensees should be able to sample the containment air within one hour under accident conditions.

The auditors reviewed available procedures and held discussions with the Radiation Protection Engineer and other licensee personnel to evaluate the licensee's conformance with NUREG-0578.

Containment air sampling would be performed using Procedure PD 15.4.007, Remote Air Sampling of the Reactor Containment. The auditors noted that no special procedures were developed for emergency containment air sampling. Therefore, the procedure did not reflect appropriate cautions, precautions, or prerequisites that would be

necessary for use of the procedures during emergency conditions. The routine procedure, when used for post-accident sampling, did not require many steps. If the portable sampling rig was pre-connected to the extended tubing lines, Steps 3 through 5 of the procedure would not be needed. Step 6, which involved sample collection times to be followed, would then be of shorter duration. There were no cautions concerning avoidance of these steps in the procedure.

- Provisions for labeling the collected samples or methods of transporting the radioactive samples were not included or referenced to other procedures. The auditors noted that a data form was included as an attachment and that the sampling could be completed in one hour.

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

- Development of procedures for containment air sampling under accident conditions when the interim sampling equipment installed for that purpose must be used (272/81-07-48; 311/81-08-48).

5.4.2.7 Post-accident Containment Air Sample Analysis

Section 2.1.8 a of NUREG-0578 specifies that licensees should be able to analyze the containment air samples for iodines, particulates and noble gases within two hours under accident conditions without incurring a radiation exposure to any individual in excess of 3 rems to the whole body or 18 3/4 rems to the extremities. The auditors reviewed available procedures and held discussions with the Radiation Protection Engineer and other licensee personnel to evaluate the licensee's conformance with NUREG-0578.

Containment air sample analyses would be performed using the following procedures:

- RP 4.008, Airborne Particulate Activity Determination,

- RP 4.009, Airborne Iodine Determination, and

- RP 12.332, High Activity Sample Analysis Instructions.

The auditors noted that RP 4.008 and RP 4.009 were written for use during normal operation. RP 12.322 had been developed for emergency conditions and reflected appropriate cautions, precautions and prerequisities. The licensee stated that all personnel trained for sample analyses were aware of the high activity sampling procedure since this procedure was also used for all routine samples with dose rates greater than 100 mR/hour.

Some of the actions required by RP 12.332 included donning protective clothing, preparing the counting lab, calculating dose estimates for the extremities and monitoring background radiation levels. Instructions were also given for sample

reduction and disposal of the unused portion of the sample. The procedure referenced the routine laboratory counting procedures (RP 4.008 and 4.009) for sample counting.

The auditors noted that after counting, subsequent actions were included within RP 12.332, High Activity Sample Analysis Instruction. These included reporting the data using an attached data sheet. The data dissemination was not specified and the data was not used to evaluate EALs as part of the considerations for recommending protective actions based on plant conditions. (See Section 5.4.2)

In discussions with the licensee, it was revealed that a Radiation Protection Supervisor would implement this procedure. The decision to use an alternate counting lab, if the background radiation levels would become too high, was one of the tasks assigned.

The auditors determined that the analytical procedures provided adequate procedural capability for evaluating the collected samples and that the sample analyses could be completed within two hours.

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:

- Description of the dissemination of the containment air sample analytical results within the procedures governing containment air sample analyses (272/81-07-49; 311/81-08-49).

5.4.2.8 Post-accident Gaseous and Particulate Effluent Sampling

The auditors reviewed the licensee's implementation of NUREG-0578, paragraph 2.1.8.b, post-accident gas and particulate effluent sampling capabilities to verify that the licensee could sample high activity effluent during accident situations.

The auditors reviewed available procedures and held discussions with the licensee's chemistry personnel to evaluate the provisions. A special emergency procedure was developed during the appraisal to be used with the remote plant vent sampling location that had been installed during the appraisal (See Section 4.1.1.7). Stack effluent sampling would be performed using Procedure PD 3.4.072, Emergency Sampling Procedure for the Plant Vent. The procedure had a checklist for the emergency sampling equipment, but items such as dose rate survey meters, shielding blocks, sample holders, data sheets and electrical extension cords were not included in the procedure. Precautions concerning high activity sampling were addressed and the procedure exposure limits were to be provided on a REP prior to sampling.

The sampling location was clearly described in the procedure and diagrams were included to illustrate how the sampling device should be assembled. The auditors questioned the licensee regarding procedural Step 3 under Precautions, which stated that the installed containment

ventilation monitor flow rate must be verified before the start of sampling. Since the flow monitor was located at the original sampling location, personnel could be exposed to excessive dose rates. Other shortcomings of the emergency sampling procedure involved transporting and labeling of the high activity samples. There were no equipment provisions or methods described for transporting the samples to the counting labs or labeling them for subsequent identification.

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:

- Development of a method to verify the containment vent flow rate at the post-accident sampling location (272/81-07-50; 311/81-08-50).

- Provisions for equipment to transport high activity post-accident plant vent samples (272/81-07-51; 311/81-08-51).

- Provisions for data sheets and labeling methods for post-accident plant vent samples (272/81-07-52; 311/81-08-52).

5.4.2.9 Post-accident Gaseous And Particulate Effluent Sample Analysis

The auditors reviewed the licensee's implementation of NUREG-0578, paragraph 2.1.8.b, post-accident gaseous and particulate effluent analytical capabilities, to verify that the licensee had the ability to analyze high activity effluent samples during accident situations. The auditors reviewed available procedures and held discussions with the licensee's chemistry personnel to evaluate the licensee's provisions for performing stack effluent sample analyses. The auditors noted that no special procedures were developed for emergency conditions, but rather, the procedure used during routine operation was relied upon.

Stack effluent sample analyses would be performed using Procedure PD 3.3.020, Plant Vent Sample Analysis. The auditors noted that, since these procedures were written for use during normal

operation, they did not reflect appropriate cautions, precautions or prerequisites that would be necessary for use of the procedures during emergency conditions. The only radiological precaution described was to wrap all samples in plastic to prevent the counting facility from becoming contaminated. During discussions with the licensee, the auditors were informed that the station's radiation protection personnel would be informed prior to the sample analysis and they would prescribe measures to protect laboratory personnel working with the high level samples.

The analytical procedure appeared to be adequate for evaluating the samples collected. Results could be completed in two hours, however, the auditors noted that the procedure did not specify provisions for reporting the results to the organizational element responsible for the assessment function. Also, the procedure did not have provisions for keying results to EALs or as part of the considerations for recommending protective actions.

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:

- Inclusion of radiation protection precautions within the procedure for high activity post-accident plant vent sample analysis (272/81-07-53; 311/81-08-53).

- Specification of the appropriate organizational element who would receive post-accident plant vent sample analytical results and original data sheets (272/81-07-54; 311/81-08-54).

- Interface of post-accident plant vent sample results with EALs and protective action recommendations (272/81-07-55; 311/81-08-55).

5.4.2.10 Liquid Effluent Sampling

The auditors reviewed available procedures and held discussions with chemistry personnel to

evaluate the licensee's provisions for performing liquid effluent sampling under emergency conditions. The auditors noted that no special procedures were developed for emergency conditions. Procedures used during routine operation were relied upon.

Radioactive liquids discharged from the Reactor Coolant System during startup, shutdown, load changes and boron dilution are stored in the CVCS Hold Up Tanks. Liquid effluent sampling would be performed using Procedure PD 3.5.064, Sampling of the CVCS HoldUp Tanks, Rev. 2.

The procedure included a checklist of sampling equipment, precautions relaying the possibility of high radiation in the liquid effluent sampling area and referenced Procedure PD 15.7.008 for radiation protection during handling and tagging of radioactive samples. The procedure also stated that a survey of the area should be taken before taking a sample. A REP would be issued prior to sampling and would set radiation exposure limits.

The auditors noted that the procedure was easy to follow. Valves were properly labeled and procedures relating to grab sampling techniques were referenced (PD 3.5.025, 3.5.026).

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

5.4.2.11 Liquid Effluent Sample Analysis

The auditors reviewed available procedures and held discussions with chemistry personnel to evaluate the licensee's provisions for performing liquid effluent sample analyses under emergency conditions. The auditors noted that no special procedures were developed for emergency conditions, but rather, the procedures used during routine operations were relied upon.

Liquid effluent sample analyses would be performed using Procedures PD 3.8.015, Use of Liquid Waste Release Form (RLRF), Rev. 4, and PD 3.3.012, Use of Canberra 8100 Multichannel Analyzer for Gamma Scans, Rev.

3. The auditors noted that since these procedures were written for use during normal operation, they did not reflect appropriate cautions, precautions, or prerequisities that would be necessary for use of the procedures during emergency conditions. For example, cautions dealing with handling high activity sample dilutions and provisions for preventing samples from contaminating the counting equipment were not described. Alternate counting facilities and data sheets specifying who should receive the results were available. The analytical methods could be performed within two hours.

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:

- Development and implementation of provisions for precautions and prerequisites for analyzing high activity liquid effluent samples (272/81-07-56; 311/81-08-56).

5.4.2.12 Radiological Environmental Monitoring Program (REMP)

The auditors reviewed the Salem Generating Station Emergency Plan - Recovery Management, Section 1, Section 8 and Appendix B; Radiation Protection Instructions PD 15.12.215 and Section 14.1.7 of the Emergency Plan.

Review of the above references and discussions with licensee staff indicated that the licensee had provisions to implement a REMP which takes into account the assignment of duties for the collection and evaluation of environmental TLDs, soil, water and biological samples. Radiological and chemical analytical capabilities were available through its Energy Laboratory at Maplewood, NJ, RMC and Ichthyological Associates, Inc. (IA), who would perform biological sampling. IA had boats and sampling equipment necessary to obtain the required aquatic samples and had a documented, coordinated management structure for an emergency environmental monitoring program. They also had

the necessary equipment and laboratory facilities through its own laboratories and through its contractors to conduct the monitoring program.

The auditors noted that the the Radiological Emergency Manager at the EOF, was assigned responsibility for initiating long-term environmental monitoring and coordinating such monitoring with onsite actions and conditions. The Radiation Protection Engineer (Radiation Protection Senior Supervisor), however, could initiate an Emergency Radiation Survey for field monitoring at the request of the Senior Shift Supervisor/EDO. It was noted Procedure PD 15.12.315 stated that samples and environmental TLDs may be changed only with the approval of the Senior Supervisor of Radiation Protection and by Maplewood Lab personnel. There was no mention of the Radiological Emergency Manager. (See Sections of this report 2.1 and 2.2 for related findings).

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

5.4.3 Protective Actions

5.4.3.1 Radiation Protection During Emergencies

The auditors noted that the licensee had developed an entire set of procedures governing the conduct of radiation protection activities under emergency conditions. Topics covered included, exposure limits, personnel dosimetry, ALARA, access controls, REP preparation, exposure records, training, potassium iodide for thyroid blocking, and protective clothing and equipment. In addition, the auditors noted that the majority of other procedures which require the performance of actions involving actual or potential exposure to radiation contained appropriate radiological cautions, precautions and prerequisites.

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

5.4.3.2 Evacuation of Owner-controlled Areas

As discussed in Section 5.3, the licensee's Emergency Procedures did not provide methods or action levels for determining when plant evacuation would be prudent or required. Evacuation routes were posted inside the Unit 1 Controlled Area but nowhere else in the plant. Emergency Procedure EP I-12, Site Evacuation, specified the action to be taken to implement site evacuation, including the announcement to be made over the plant PA sytem following the sounding of the radiation alert alarm. Evacuees would be directed to proceed, without monitoring, to the end of the access road for further instructions. Health Physics personnel are to monitor personnel and vehicles at the offsite assembly area designated by the EDO. The procedure contained a table which specified "Personnel Release Limits". The procedure also indicated that HP personnel are to establish control points for decontamination, and clean and contaminated areas at the EOF. However, no provisions for decontamination supplies were identified.

The assembly area at the end of the access road was approximately two miles from the site and was an area with limited space. The auditors determined that use of this area could result in blocking of the only ingress/egress for the Salem and Hope Creek sites. The Hope Creek site procedures provided for monitoring of personnel prior to evacuation, however, no offsite assembly areas were specified. Contaminated individuals would be told to "go home and shower." Vehicles found to be contaminated would be identified for later decontamination.

Based on the above findings, improvement in the following area is required to achieve an acceptable [illegible]

- Clarification of the procedures and procedural interfaces governing evacuation of the Salem and Hope Creek sites, to include clear protective action guides and provisions for mitigating any adverse effects which

are determined to exist in connection with the use of a single road evacuation route from the site (272/81-07-57; 311/81-08-57).

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

- Posting of evacuation route signs in the Unit 2 Control Area (272/81-07-58; 311/81-08-58).

5.4.3.3 Personnel Accountability

Emergency Procedure EP I-8, Personnel Accountability specified the actions to initiate accountability. This procedure also specified the accountability stations and the actions to be taken if personnel are unaccounted and includes reference to Procedure EP I-9, Search and Rescue Operations. The Emergency Plan specified the duties and responsibilities of personnel during accountability. The Security Accountability Procedure 80-134, dated October 21, 1980, specified the actions to

be taken by security personnel. The auditors observed an accountability drill, during which it required approximately 50 minutes to complete the accounting of all personnel during the day shift.

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

5.4.3.4 Personnel Monitoring and Decontamination

The auditors reviewed the following procedures to verify that the licensee had established provisions for monitoring and decontaminating individuals and equipment leaving restricted areas and at assembly/reassembly areas:

- RP 12.233, Personnel Decon Initiation;
- RP 12.234, Equipment Decon Initiation;
- RP 12.333, Personnel Decon Instructions; and

- RP 12.334, Equipment Decon Instructions.

Procedures for monitoring personnel leaving restricted areas were the routine monitoring procedures in effect day-to-day. If contamination is site-wide, personnel in the assembly areas or reassembly areas would be monitored by the onsite survey team. The auditors noted that there were no procedural provisions for monitoring or decontaminating personnel at assembly/reassembly areas. (See Sections 4.1.2.1, 4.1.2.3 and 5.4.3.2 for related findings).

The routine decontamination procedures provided a means to record personnel contamination incidents. Procedure RP 12.233 was written to provide guidance for decontamination of an injured, contaminated person. The primary skin decontamination procedure utilizes soap and lukewarm water. More serious cases would be sent to Salem County Memorial Hospital where additional procedures were available for use in conjuction with medical advice. Personnel are released as

decontaminated/uncontaminated if radiation levels are below 0.1 millirem/hr or or 1000 dpm/100 square centimeters. Decontamination action levels were posted on the walls of the decontamination room along with specific decontaminat'on procedures. The radiation protection instruction governing decontamination listed several interfacing procedures and referenced other documents for alternative decontamination methods. Documentation of all cases of personnel external contamination would be done when levels are greater than 10,000 dpm/100 square centimeters or 0.1 mrem/hr. Internal contamination cases would be handled through the Salem County Memorial Hospital and, if necessary, through arrangements with RMC and the University of Pennsylvania.

Action levels were specified in the routine procedures, above which further assessment, such as whole body counting and bioassay is required. The procedures also required that the collected data be analyzed and stored in the Radiation Protection Office.

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

- Specification of the procedures for monitoring and decontaminating persons and vehicles at assembly areas or at reassembly areas, to include persons and vehicles which may be evacuated from the Salem and Hope Creek sites (272/81-07-59; 311/81-08-59).

5.4.3.5 Onsite First Aid/Search and Rescue

The auditors reviewed the licensee's procedures and held discussions with licensee personnel to verify that provisions for locating and treating injured personnel were adequate.

The following procedures discussed the licensee's provisions for locating, transporting and handling injured persons who may also be contaminated:

- EP I-5, Personnel Emergency;

- EP I-9, Search and Rescue Operations;

- RP 12:233, Personnel Decon Initiation; and

- RP 12.333, Personnel Decon Instructions.

The auditors noted that the procedures covered all key aspects such as search methods, radiation protection considerations, interface with offsite medical treatment facilities and transport methods. The auditors noted that while the composition of the search and rescue team was defined in Procedure EP I-9, the team was not defined in the training program (See Sections 2.0 and 3.0 for related findings).

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

5.4.4 Security During Emergencies

Plant management stated that there were no procedures for special security measures or considerations during radiological emergencies and that site contingency procedures did not address radiological emergencies.

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

- Development of procedures for security under emergency conditions (272/81-07-59; 311/81-08-59).

5.4.5 Repair/Corrective Actions

Discussions with licensee personnel indicated that no procedures were developed governing the concept of operation of repair and corrective action teams.

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

- Development of procedures which will govern the emergency actions of repair and corrective action teams (272/81-07-60; 311/81-08-60).

5.4.6 Recovery

The Recovery Plan, Section 12, indicated that reentry would be made in accordance with the Radiological Protection Procedures and with the permission of the EDO. The decision to change emergency class will be made by the EDO using guidance from the Recovery Manager, Emergency Coordinators for New Jersey and Delaware, and the senior NRC representative at the scene. The Recovery Management Organization as described in the Emergency Plan assumes a broader role than the post-accident support role implied by the term "recovery". The Recovery Management Organization would provide emergency reponse assistance to the station for accident assessment and protective action decision-making during the accident. No specific criteria indicated when a "Recovery Phase" would begin and, in the context of the Recovery Plan, there was no recovery phase. The Emergency Plan Manual Implementing Procedures Introduction, Section VI, "Recovery Operations", stated:

A. CRITERIA

An incident shall be considered under control for the purpose of initiating recovery operations when the following criteria are met:

1. Radiation levels in all areas are determined to be stable or decreasing with time.

2. Release of radioactive materials from all portions of the plant are controlled.

3. Fires, flooding and/or equipment malfunctions are controlled.

B. RE-ENTRY

Recovery operations will be conducted in a manner in which each individual operation is evaluated as to its total and individual person REM. All exposures will be maintained with the ICRP recommendations and all attempts will be made to maintain exposures within 10 CFR 20 limits as required by the Radiation Protection Department Manual.

The EDO will direct all recovery operations in accordance with Emergency Procedure EP I-14, Recovery Operations.

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:

- Specification of specific criteria upon which the emergency classes will be downgraded and provisions for notification of federal, state and local officials prior to entering a downgraded mode (272/81-07-61; 311/81-08-61).

5.4.7 Public Information

The Recovery Plan, Section 9, specified general authorities, responsibilities and specific duties of the Public Information Manager. The Public Information Manager would serve as the primary contact in the plant area for representatives of the news media and state and local public information officers. He/She would activate the News Center. (See Section 4.1.4).

The Information Services Department had prepared an "Emergency Public Information Program" which further described communications with the media. This program provided for a corporate news center in Newark in addition to the center in Salem but did not describe its role. This program indicated there would be a designated spokesman but did not indicate how he or she would be chosen.

Licensee personnel stated that there were provisions for a single point of press contact through the corporate news center initially, until this contact can be transferred to the Salem News Center. They also stated that the licensee had a memorandum of understanding with New Jersey and Delaware which specified that the site would be the sole source of news releases on plant conditions and the states would be the sole source of news releases for offsite protective action information. The auditors noted that this was not specified in the "Emergency Public Information Program." The "Emergency Public Information Program" further specified that "the Customer and Marketing Departments may have to be pressed into service to handle inquiries from alarmed residents, but, failed to specify how these inquiries would be answered.

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

5.5 Supplementary Procedures

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

Procedure, EP II-13, provided a specific, not generic, listing of all equipment reserved for use during emergencies and specified the location of the equipment.

The frequency at which emergency equipment is inventoried, operationally checked and/or calibrated is monthly. Communications equipment is in normal day-to-day use by security personnel. Spare batteries for the instruments were available.

The responsibility for the performance of the emergency equipment readiness checks and for correcting any noted deficiencies is assigned the Radiation Protection Engineer.

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

5.5.2 Drills and Exercises

Procedure EP II-1, Conducting Emergency Plan Exercises and/or Drills, specified that drills and exercises would be conducted by order of the Assistant to Manager - Salem Generating Station. This procedure provided for scenario development in advance of the drill, review of the scenarios,

assignment of observers, guidelines for conducting the drills and exercises, critiques, duties of the coordinator, and SORC review of deficiencies and recommendations for resolution. The procedure assigned the Assistant to Manager to ensure that all deficiencies are adequately reviewed and corrected. Table I of the Emergency Procedures specified the drill and exercise schedules for the following:

- Exercises with States of New Jersey and Delaware (annually);

- Communications drills with state and county governments (monthly);

- Communication drill with NRC, DOE, U.S. Coast Guard and digestio. pathway states (quarterly);

- Communication drills with licensee facilities and teams (annually);

- Fire Brigade (quarterly);

- First Aid (quarterly);

- Medical Emergency (annually);

- Radiological Monitoring (annually);

- Health Physics (Semi-Annually); and

- Personnel Accountability (Semi-Annually).

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

5.5.3 Review, Revision and Distribution of Emergency Plan and Procedures

The Emergency Plan, Section 18.0, indicated that the Manager - Emergency Preparedness will be responsible for insuring that the telephone numbers listed in the Emergency Plan Implementing Procedures are updated quarterly, however, no procedural method to cover this function was developed.

The Emergency Plan and procedures were reviewed annually by QA operators (See Section 5.5.4). Section 18 of the Emergency Plan listed the plan holders, however, the

Director of Nuclear Reactor Regulation, NRC, was not listed as required by 10 CFR 50, Appendix E, IV. Section 13 of the Recovery Management Manual listed the manual holders, however, the NRC Region I office and the Director of Nuclear Reactor Regulation were not listed as required. The Emergency Plan Manual Implementing Procedures and Radiation Protection Procedures did not contain distribution lists. The NRC had only received informational copies of the Emergency Plan and Emergency Plan Manual Implementing Procedures rather than controlled copies, and had not received any copies of the Recovery Management Manual or the Radiation Protection Instructions and Security Procedures which implement portions of the Emergency Plan.

A review of the Radiation Protection Instructions and Emergency Plan Manual Implementing Procedures indicated that they had been reviewed by Station QA and the SORC. The Emergency Plan, however, had not been reviewed by QA or the SORC, yet these had been implemented. Licensee management stated that the Emergency Plan was about to receive a SORC review. The auditors further noted that the Recovery Management Manual and associated procedures were signed and dated, indicating review by the Manager - Emergency Preparedness, General Manager - Nuclear Production

and the Vice President - Production. The Recovery Management Manual had not, however, received the required QA or SORC review as required by the SNGS Technical Specifications. The review and approval signoff sheet in the manual did not provide a space for QA and SORC review signoff. The auditors determined that this was a further indication of the lack of coordination between the station and corporate staffs in the emergency preparedness effort. (See Section 1.0)

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

- Development of procedures for reviewing, approving, revising and distributing the documents comprising the emergency preparedness program and its implementation to ensure consistency with the plant technical specifications (272/81-07-62; 311/81-08-62).

- Review of all documents comprising the emergency preparedness program to ensure consistency, proper approval and distribution (272/81-07-63; 311/81-08-63).

5.5.4 Audits of Emergency Preparedness

Salem Nuclear Generating Station Technical Specifications specified that the Nuclear Review Board (NRB) shall audit the Emergency Plan and Implementing Procedures at least once every 24 months. In addition, the Technical Specifications specified that the Station Operations Review Committee (SORC) shall be responsible for review of the Emergency Plan and Implementing Procedures and shall submit recommended changes to the Chairman of the NRB. Section 18 of the Emergency Plan specified that the Manager - QA Operations and Maintenance audits the Emergency Plan, procedures, training, readiness and equipment annually. Licensee management at the site stated that QA Operations conducts its audits of emergency preparedness at the direction of the NRB which would be once every 24 months as stated in the Technical Specifications and not annually as implied by the Emergency Plan. The auditors reviewed the QA audit schedule and the results of the 1980 audit. This audit addressed implementation of the Emergency Plan, adequacy of equipment, response to drills and communications. Licensee management stated that the QA audit included

observation of drills and exercises. The auditors noted that the annual audit cycle stated in the Emergency Plan was consistent with regulatory requirements of 10 CFR 50.54(t).

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

6.0 COORDINATION WITH OFFSITE GROUPS

6.1 Offsite Agencies

The auditor contacted responsible individuals within the following groups to verify that they understood their responsibilities and procedures in response to an emergency at the licensee's facility that these understandings were consistent with the agreements and licensee procedures and the expectations of both parties: Lower Alloways Creek Police Department; Fire Department; Rescue Squad; Public Safety Office; Salem County Fire Dispatcher and Memorial Hospital; Cumberland County Communications Office; State of New Jersey, Bureau of Radiation Protection; New Jersey State Police; Department of Energy (DOE); Newark and New Castle Counties, Delaware; Department of Public Safety, Kent County Courthouse, and the U.S. Coast Guard.

These contacts verified that the licensee had contacted the responsible agencies for the purpose of conducting drills, exercises, and where applicable, training. The licensee had secured a contractor (Stone & Webster) to provide emergency plan training to personnel of the Delaware State Emergency Planning and Operations group. RMC provided training to the Salem County Memorial Hospital Staff. The agencies having emergency response roles within the EPZ were provided with

controlled copies of the licensee's plan and procedures. Each agency representative contacted expressed satisfaction with the licensee's coordination efforts in relation to notifications, frequency and nature of training provided, and routine planning information exchange.

The licensee's protective action guides and related recommendations appeared to be consistent with those of the the states of New Jersey and Delaware. The offsite agencies appeared to have reviewed the emergency actions, protective action guides and associated protective action recommendations for each emergency class. Agreements between the licensee and offsite groups were all signed within the last 12-month period and the groups contacted stated that the agreements would be honored.

During the appraisal, the Emergency Preparedness Coordinator for the NRC Region I Office of Inspection and Enforcement met with members of the licensee's emergency planning staffs and toured the licensee's emergency response facilities. The Region I Emergency Preparedness Coordinator also met with the members of the appraisal team to discuss organizational and procedural considerations relating to interface of the licensee's response organization with that of the NRC.

The Region I Emergency Preparedness Coordinator noted that the available workspace, existing telecommunications equipment, licensee emergency facility use concept for the TSC and EOF, as well as the licensee's emergency organization configuration, did not demonstrate adequate interface with the NRC. (See Sections 2.1, 2.2, 4.1.1.2, 4.1.1.4 and 4.2.3).

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

- Coordination of the interface of the PSE&G emergency organization and its activities with the emergency organization and activities of the NRC (272/81-07-63; 311/81-08-63).

6.2 General Public

Section 8.1 of the Emergency Plan described the licensee's provisions for disseminating emergency planning information to the transient and permanent residents of the plume exposure EPZ using bill inserts, pamphlets, advertisements in locally distributed newspapers or telephone books, placards, and/or postings at recreational facilities. This emergency action information is to be coordinated and approved by state and local agencies. According to Section 8.1 and Section 8.3 of the Emergency Plan, this information will be updated and

disseminated at least annually when the material becomes available. Discussions with responsible licensee personnel indicated that none of the bill inserts, pamphlets, or advertisements, etc. had been developed. Consequently, the auditors were unable to verify whether the information provided to the public met the content outlined in the Emergency Plan. The licensee representative stated that when available, the information will be disseminated using bill inserts, pamphlets, advertisements in locally distributed newspapers or telephone directories, placards and/or postings at recreational facilities as appropriate.

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

- Distribution of the information prepared for public dissemination regarding the actions to be taken by individuals within the Emergency Planning Zone (272/81-07-64; 311/81-08-64).

6.3 News Media

Section 8.3 of the Emergency Plan specified that, at least annually, all appropriate local news media representatives will be invited to attend a media information program that will present information on nuclear emergencies, radiation, and emergency planning. The auditors

noted that the scope of information provided did not include information relative to protective actions. Licensee management stated that this program would be conducted as part of the annual emergency exercise. Press kits to be distributed were described in the "Emergency Public Information Program". The kits were to contain views of the site, diagrams of the principal components of the reactor, diagrams of the site layout, maps, an AIF booklet with questions and answers on nuclear emergency and short biographies of key PSE&G personnel. These kits were examined by the auditors.

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:

- Inclusion of information in the press kits on the Emergency Plan and protective actions to be taken by the public (272/81-07-65; 311/81-08-65).

7.0 DRILLS, EXERCISES AND WALK-THROUGHS

7.1 Drill and Exercise Program Implementation

Licensee management stated that 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). The critiques identified items requiring improvement. The Assistant to the Manager was responsible for review and correction of deficiencies. Licensee management stated that the deficiencies identified during the past year have been addressed. In addition, QA also performed an audit (See Section 5.5.4) to insure that deficiencies observed were addressed.

Based on the above findings, this portion of the licensees program appears to be acceptable.

7.2 Walk-Through Observations

7.2.1 Emergency Detection (EAL Recognition) and Emergency Classification

The auditors walked two EDO-qualified personnel through EAL recognition and event classification, one during the backshift and one during the daylight shift.

In the first case, Emergency Instructions EI I-4.3, LOCA, and EI I-4.7, Steam Generator Tube Failure were used by the auditors to cue the action. The EDO was told to assume that the conditions in the EIs existed and to demonstrate and talk his way through his response. The individual was requested to make suggestions on how the emergency classification system in use could be improved. During the walk-through, the EDO stated several times that he thought he should be using the Emergency Procedures and that he believed that the appropriate Emergency Procedures to be implemented were referenced in the EIs (See Sections 5.2 and 5.3). When it became apparent to the EDO that the Emergency Procedures were not referenced in the EI, he proceeded to the Emergency Procedures and attempted to classify the event. The auditors observed that the EDO had difficulty classifying the accident and questioned the EDO to establish the reason. The EDO indicated that the EALs were not in terms of specific instrument readings and that the EALs or EPs should have been referenced in the EIs. The auditors asked the EDO if he had been given an

opportunity to review the EALs contained in the Emergency Procedure. He stated he had received training on the EALs but had not been asked to review the EALs for usability.

In a second walk-through, the auditors asked an EDO to indicate the actions to be taken if certain effluent monitors were offscale. The EDO stated that his first action would be to use the appropriate alarm procedure to determine if the readings were valid. The EDO also indicated that he would use the interim high range monitor (R-43) under these conditions. The EDO, however, was unable to locate the readout for this monitor. The EDO then proceeded to EI I4.16, "Radiation Incident," which referred him to Emergency Procedure EP I-3, "Site Emergency." The EDO examined the EALs in EP I-3 but could not determine whether they had been exceeded since they were not presented in terms of control room indicators (i.e., mR vs. cpm). He stated that he felt sure EP I-3 Action Level 1.a (i.e., J 50 mR/hr for 1/2 hr or 500 mR/hr for 2 minutes under adverse meteorology) would be exceeded if the monitors were offscale, but that this would require a dose calculation to confirm. He indicated that he would declare the emergency without doing the dose calculation if the monitors were offscale. The auditors walked through EP I-3 with the EDO who explained his actions. At the step requiring

the dispatch of radiation protection personnel to the control room and to the TSC to do dose calculations, the EDO was asked to contact the Radiation Protection Department to send someone to the TSC. The Radiation Protection Department sent an individual to the TSC and he participated in a dose calculation walk-through (See Section 7.2.2). The EDO continued to follow the steps in EP I-3 until he reached Step 14 which stated, "If site evacuation becomes necessary, evacuate in accordance with EP I-12." The EDO indicated that this "if" condition required him to make a value judgement and that such step should not be in the procedure unless the basis for the decision was also specified. Despite this, he stated from memory the local plant environment onsite evacuation criteria contained in Table I of EP I-12 but could not find this Table I in the procedure since EP I-12 was the procedure to implement evacuations, not to determine when it would be required. He then stated that the decision to evacuate would be made based on dose projections performed by radiation protection personnel.

The findings summarized above were evaluated as part of the findings in Sections 3.2, 5.2 and 5.3 of this report.

7.2.2 Dose Calculations

The auditors conducted three walk-throughs of the licensee's dose calculation methods. One was conducted on the backshift and two during the dayshift.

During the backshift walk-through, the auditors selected a hypothethical set of initiating events which would require the participant to use default calculations due to an unmonitored release. The dose computer was stated to be inoperable so the participant could demonstrate performance using the "hand" calculation method of Procedures PD 15.12.318 and PD 15.12.317. The individual began by using PD 15.12.318, but stopped when he determined that he did not know how to obtain all of the information needed to complete the calculation. After about 45 minutes, the participant stated that he could not solve the problem. The auditors informed the participant that, in order to use Procedure PD 15.12.318 for unmonitored releases, PD 15.12.317 had to be used also. The individual stated that he had only had about 1 1/2 hours of training and that the procedure was hard to use.

A second walk-through of the same scenario on the dayshift indicated similar problems. The individual was, however, able to finally solve the problem after obtaining his training notes and recognizing the interface of the two aforementioned procedures.

A third walk-through with the individual using the dose computer indicated no impediments to rapid completion of the projection.

The observations summarized above were considered in the findings of Sections 3.2 and 5.4.2 of this report.

7.2.3 Post-accident Coolant Sampling and Analysis

The auditors conducted a primary coolant sampling and analysis walk-through with the chemistry and radiation protection personnel to simultaneously evaluate organizational factors, equipment, facilities, procedures and training. The auditors made observations, proposed questions and discussed the procedures with the demonstrators.

Four teams of two people each were used to take an simulated post-accident coolant sample. These teams were briefed on four occasions before the actual sampling procedure began. The briefing session discussed the type of protective clothing and dosimetry to be worn, as stated on the REP, assigned tasks to the individual teams and included a read-through the procedure.

Once the briefing sessions were over and the teams were sure of what they were supposed to do, two teams were sent to setup the chemistry and primary coolant laboratory. The detailed checklist was followed and all special equipment was properly placed. (Note: During an initial walk-through, the procedure did not have a checklist and the preparation tasks appeared disorganized).

The auditors then observed two teams enter the primary coolant lab to start the sampling. One of the first problems the team occurred was communicating with the control room through respirators. The messages had to be repeated three times. Also, the person in charge of taking the sample had to lie on a potentially contaminated floor to line the sample line into the sample bottle. Nevertheless, the procedure was followed precisely with

apparently no major problems. The other team who entered the sample lab, set up the air samples and then waited in a shielded area to transport the sample. The actions of this team were guided by the briefing sessions and could not be verified against a written procedure.

While transporting the sample, the technician accidently dropped the sample holder which was inside a polybag. He was unable to maintain a firm grip on the sample with the extended sample handling tool. The individual showed appropriate actions to retrieve the sample. The team charged with the analysis responsibility also followed the procedure with no problems. They explained they had been trained numerous times to become qualified for their positions. Also, the plastic wrap used around the sample vials during counting was in another room instead of the chemistry lab.

The data were given to the Senior Chemistry Supervisor within 1 1/2 hours. He performed the calculations and reported the results to the EDO. The auditors noted that there were no written procedures for the actions of the chemistry supervisor.

Based on the observations during the walk-through, the individuals performed well. However, there were a few procedural problems as were discussed in Section 5.4.2.4. Also, under actual emergency conditions, the time needed for the briefing sessions might not be available.

7.2.4 Post-accident Containment Air Sampling and Analysis

The auditors conducted a post-accident containment air sampling and analysis walk-through with the radiation protection personnel to allow for simultaneous evaluation of organizational factors, equipment, facilities, procedures and training. The auditors made observations, proposed questions and discussed the procedures with the demonstrators.

A radiation protection technician was charged with taking the samples. After the REP was signed, he set up the portable sampling rig to the extended sampling lines as was described in the procedures. A problem first noticed by the individual was that he did not have a long enough extension cord to start the sampling pump.

After the pump was operating, the auditors observed that he was not following the procedure as it was written. He informed the auditors that three of the steps are unnecessary when using the portable sampling rig. This information was not indicated in the procedure.

When the auditors asked how he would handle the radioactive samples he stated that he would carry them in his hands, and if the dose rates were too high, return to the control point for a lead pig. Again, no information concerning sample transportation was included with the procedure. During the analysis, good counting practices were observed and the tech discussed with the auditors his numerous qualifying training sessions to operate the counting equipment.

Based on the observations during the walk-throughs the individual performed well. However, there were a few equipment and procedural problems as were discussed in Sections 4.1.1.6 and 5.4.2.6 of this report.

7.2.5 Offsite Environmental Sampling and Analysis

The auditors selected a group of persons who would, during emergency conditions, conduct offsite surveys, and held a walk-through of their actions to determine the useability and adequacy of procedures as well as the level of proficiency of personnel in taking air samples.

Personnel were instructed to take an air sample. A spiked-charcoal cartridge containing a known amount of Ba-133 was then handed to them. They were requested to perform an actual analysis of the sample and to report the results.

The auditors noted that the offsite team followed the applicable procedures and experienced no drawbacks in obtaining the air sample and in counting the Ba-133 cartridge. The results obtained were within expected accuracy.

The findings and observations summarized above were evaluated as part of the findings in Section 2.0, 3.2, 5.2 and 5.3.

7.2.6 Protective Action Decision-making

The auditors selected a group of licensee individuals who would normally participate in protective action decision-making during accident conditions in order to evaluate how decisions to implement protective actions were achieved, the organizational hierarchy used to implement and communicate such decisions, and the understanding of the informational flow from the perspective of various key individuals involved in such actions. For this purpose auditors were located at the TSC (onsite) and at the EOF (in Quinton, NJ). The auditors performed the walk-through from the TSC and EOF by questioning and observing the EDO relative to series of paramters indicative of protective action guides during a practice drill.

The EDO, after evaluating conditions onsite had his assistant follow the notification procedure consisting of a sequential series of telephone calls to offsite authorities, and in particular state EOC/BRP, etc., and relay protective action recommendations. He then called the RM in the EOF to inform him of the same.

The auditor in the EOF observed the RM as to his responsibilities and decision-making role during the same event as portrayed in the TSC. The RM consulted with the REM in order to reach a decision as to recommendations before offsite notification's would take place. He was not aware that a notification had already been made by the EDO's communicator. After consulting with the REM, the RM issued a protective action recommendation to the state which contradicted the recommendation of the EDO.

The findings and observations summarized above were evaluated as part of the findings in Sections 2.0, 3.2, 5.2 and 5.3 of this report.

8.0 LICENSEE ACTION ON HEALTH PHYSICS APPRAISAL ITEMS RELATED TO EMERGENCY PREPAREDNESS (IE INSPECTION REPORT NO. 50-272/80-03).

8.1 Procedures for post-accident primary sampling and sample analysis.

Based on the findings of the current appraisal, this item is closed.

See Sections 5.4.2.4 and 5.4.2.5 of this report.

8.2 High-range noble gas effluent monitoring.

Based on the findings of the current appraisal, this item is closed.

See Section 4.1.1.7 of this report.

8.3 Lack of assignment of emergency duties and responsibilities for radiation protection personnel, the Station Manager and repair/ corrective action teams.

Based on the findings of the current appraisal, this item remains open. See Section 2.1 of this report.

8.4 No clearly defined program for training all individuals who may be assigned emergency duties.

Based on the findings of the current appraisal, this item remains open. See Section 3.1 of this report.

8.5 Absence of procedures governing radiation protection and security activities during emergencies.

Based on the findings of the current appraisal in relation to the security procedures, this item remains open. See Sections 5.4.3.1 and 5.4.4 of this report.

9.0 EXIT MEETING

At the conclusion of the appraisal, on April 2, 1981, the auditors met with the licensee representatives denoted in Annex A to this report. The Team Leader summarized the scope of the appraisal and the significant appraisal findings.

Licensee management acknowledged the appraisal findings and indicated that, upon completion of the emergency exercise scheduled for April 8, 1981, an intensive corrective action effort would begin. Licensee management further stated that, prior to the NRC appraisal, they were aware that there were many areas which needed to be improved. Limited resources in conjunction with the short-time frame permitted by the regulations from the Emergency Plan submittal to plan implementation, however, made it difficult to accomplish all that was required. Licensee management further stated that the best job possible had been done considering the resource, time and guidance limitations.

At the conclusion of the exit meeting, NRC management from the Division of Emergency Preparedness committed to provide licensee management with a preliminary listing of specific, significant findings that would require resolution. Immediately following the exit meeting, the NRC staff met with the licensee's emergency preparedness staff and reviewed the specifics of the preliminary significant findings to ensure mutual understanding.

Subsequent to the onsite portion of the appraisal, the NRC Region I Office of Inspection and Enforcement sent a letter to licensee management dated April 7, 1981, which transmitted written descriptions of the significant preliminary findings. This was done to provide guidance for the licensee to initiate immediate corrective actions prior to receiving the final appraisal report. During a meeting on April 23 and 24, 1981 at the licensee's Quinton Training Center, the NRC and licensee representatives met to discuss the licensee's progress toward resolution of the preliminary findings transmitted by the NRC's April 7 letter. During this meeting the NRC noted that the licensee had made substantial progress toward resolution of the preliminary significant findings. As a result of the April 23 and 24 NRC/licensee meeting, the licensee replied to the April 7, 1981 NRC letter by return correspondence dated April 24, 1981. In this reply, the licensee committed to resolve all of the significant findings (with the exception of item 3, which is equivalent to item 6 of Appendix A to the transmittal letter of this report) by May 15, 1981.

The NRCs April 7 letter and the licensee's April 24 response are included as Annex C to this report.

ANNEX A

INDIVIDUALS CONTACTED

ANNEX A

INDIVIDUALS CONTACTED

1. Principal Licensee Individuals

N. Allman, Senior Staff Engineer
*W. Britz, Corporate Health Physicist
*R. Burricelli, Manager, Emergency Preparedness
*G. Daves, Engineer
W. Denham, Public Information Officer
R. Desanctis, Administration Office, Nuclear
*J. Driscoll, Chief Engineer
*R. Eckart, Senior Vice President
T. Lesh, Chief of Security
A. Lenehan, Public Information Officer
M. Metcalf, Quality Assurance Engineer
*H. Midura, Manager, Salem Station
L. Miller, Performance Engineer
*P. Moeller, Emergency Planning and Security Engineer
*J. Nagle, Engineer, Nuclear Section
J. Ronafalvy, Manager, Instrumentation and Calibration
*R. Salveson, Manager, Hope Creek Station
R. Scaletti, Safety Supervisor
*F. Schneider, Vice President, Production
*R. Silverio, Assistant to the Manager, Salem Nuclear Generating Station
*J. Stillman, Quality Assurance Engineer
*R. Swetnam, Radiation Protection Engineer
T. Vannoy, Senior Chemistry Supervisor
*R. Uderitz, General Manager, Nuclear Operations
J. Zupko, Manager, Nuclear Operations

2. Non-Licensee Individuals

L. Antonik, Consultant, Antonik Inc.
Petty Officer Bills, U.S. Coast Guard
C. Brown, Maryland Civil Defense
M. Cable, Salem County Fire Dispatcher
R. Dempsey, Kent County Fire and Ambulance Dispatcher
P. Elker, New Jersey Bureau of Radiation Protection
M. Galvin, Salem County Memorial Hospital
*M. Howard, Consultant, KMC
H. Justin, New Castle County Department of Public Safety
R. Knapp, Delaware Emergency Planning and Operations
E. Peterson, Police Chief, Lower Alloways Creek
S. Porter, Porter Consultants

F. Rocco, Consultant, Radiation Management Corp.
V. Saynisch, New Jersey Civil Defense
R. Shult, Consultant, Hydro-Nuclear Services
J. Tatum, New Jersey State Police Coordinator

3. In addition to the above, members of the appraisal team also interviewed licensee members of the plant operations, radiation protection, and corporate staffs.

*Denotes those also present at the exit meeting.

ANNEX B

FIGURES

SNGS ORGANIZATION FOR ADMINISTRATION OF EMERGENCY PREPAREDNESS

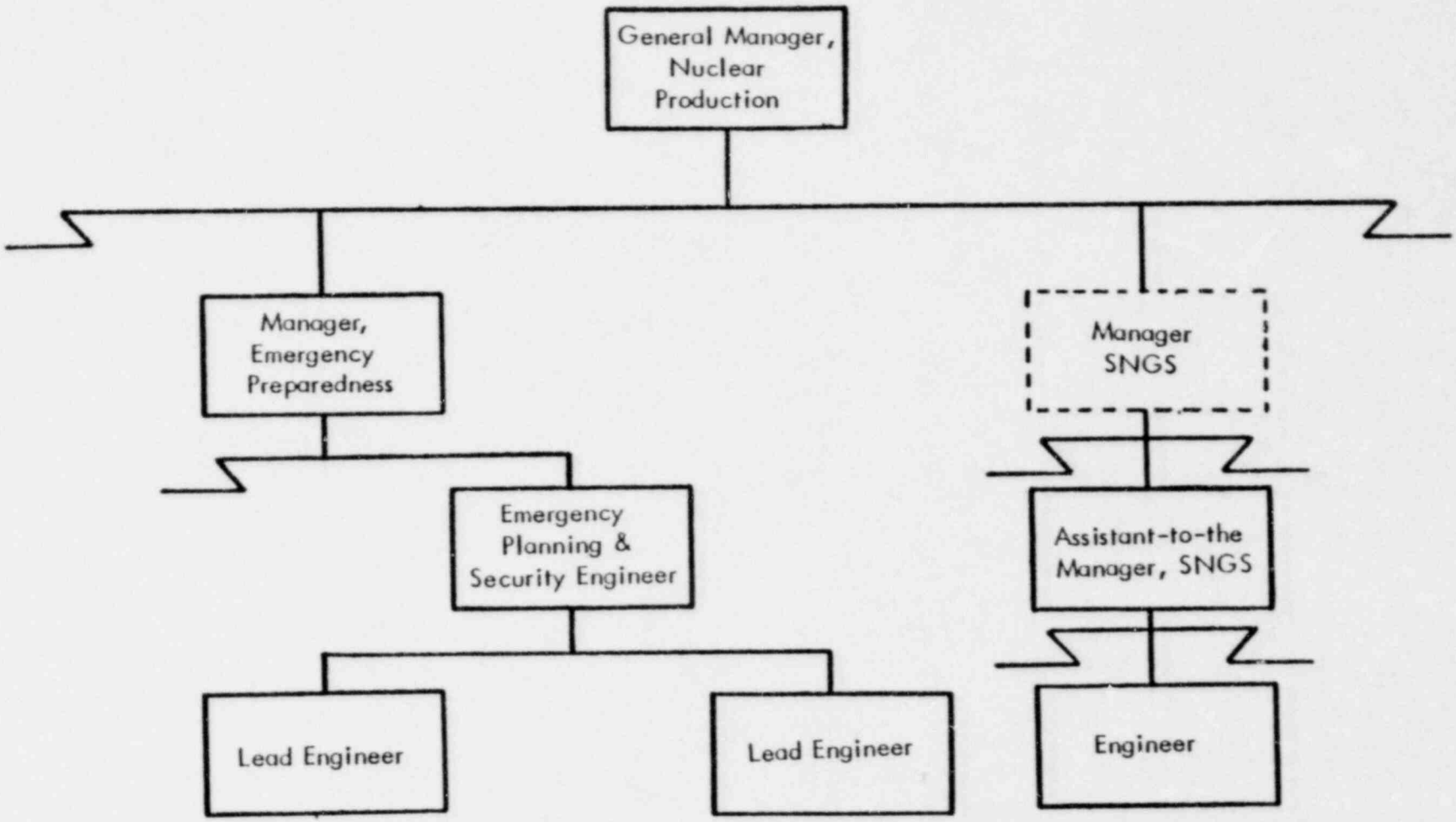

Figure 1

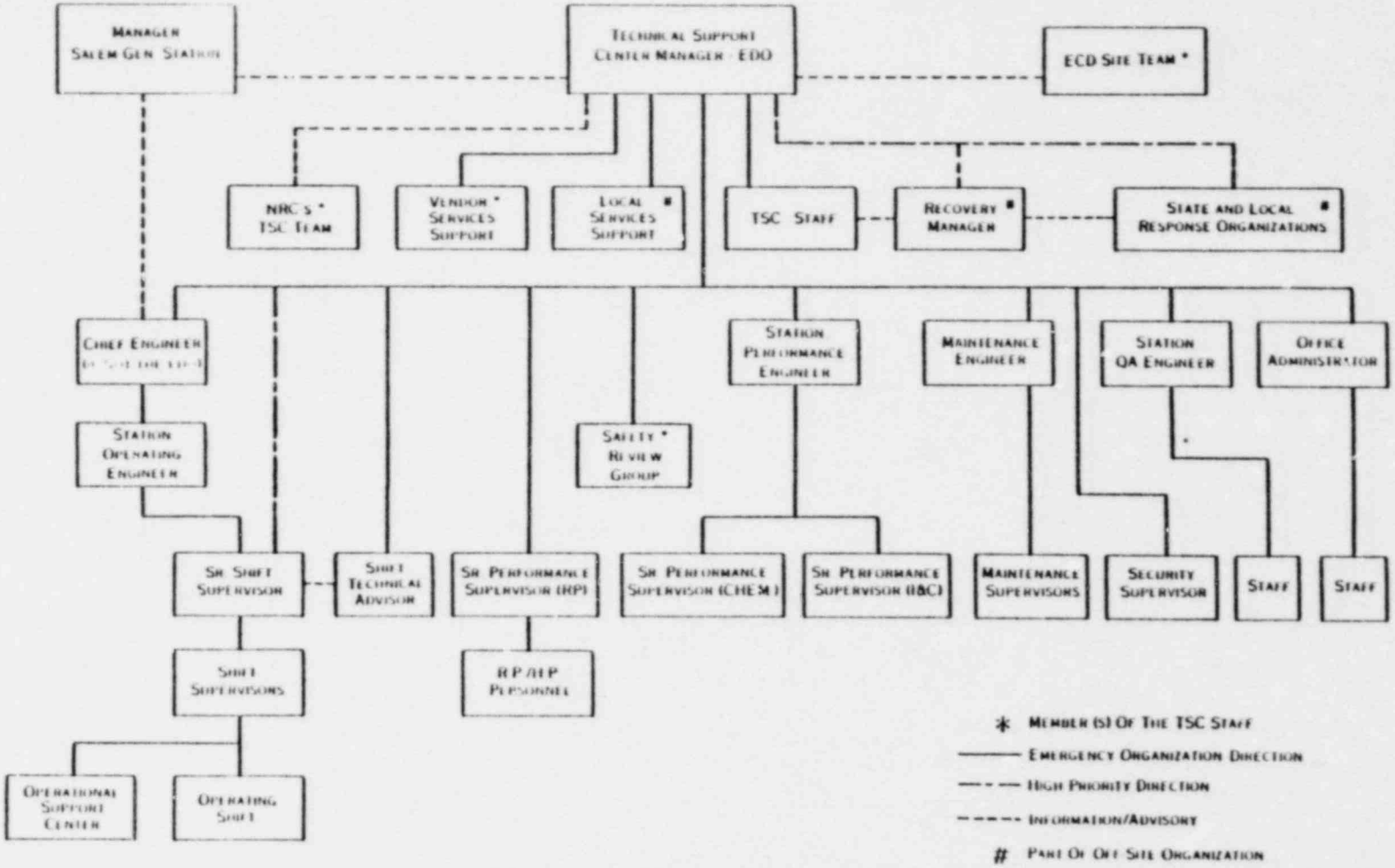

FIG. III-1 ON SITE EMERGENCY ORGANIZATION

SNGS

UNITS 1&2

FIGURE 2

RADIATION PROTECTION - INITIAL RESPONSE ORGANIZATION
(Chart re-drawn for clarity)

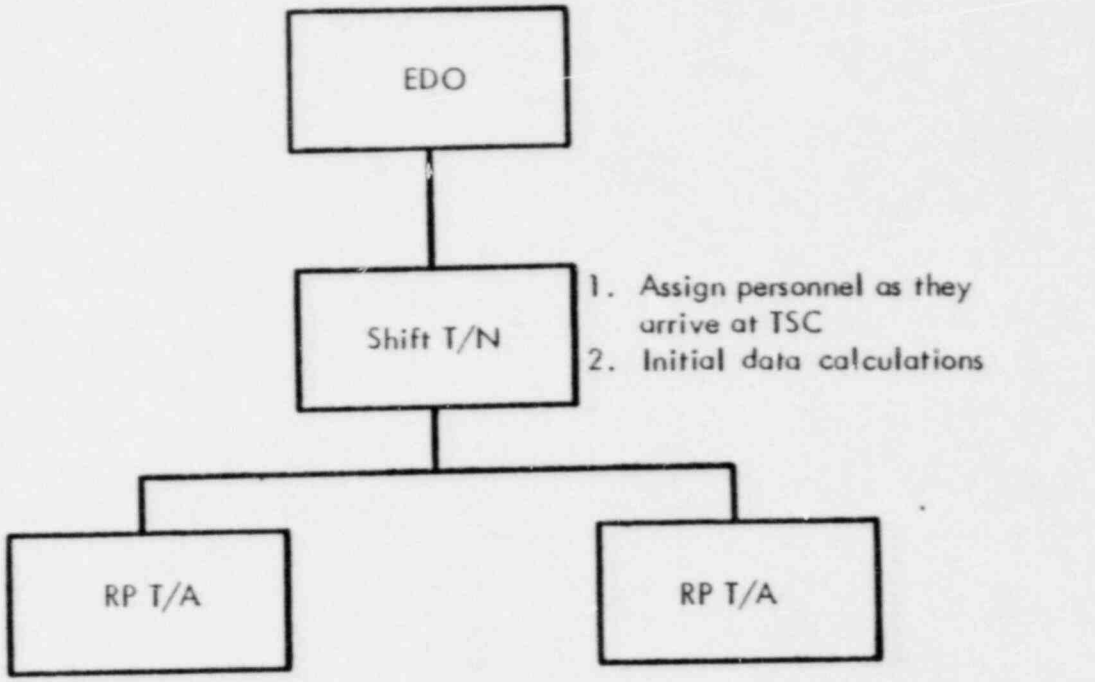

Figure 3

RADIATION PROTECTION - INTERMEDIATE RESPONSE ORGANIZATION
(Chart re-drawn for clarity)

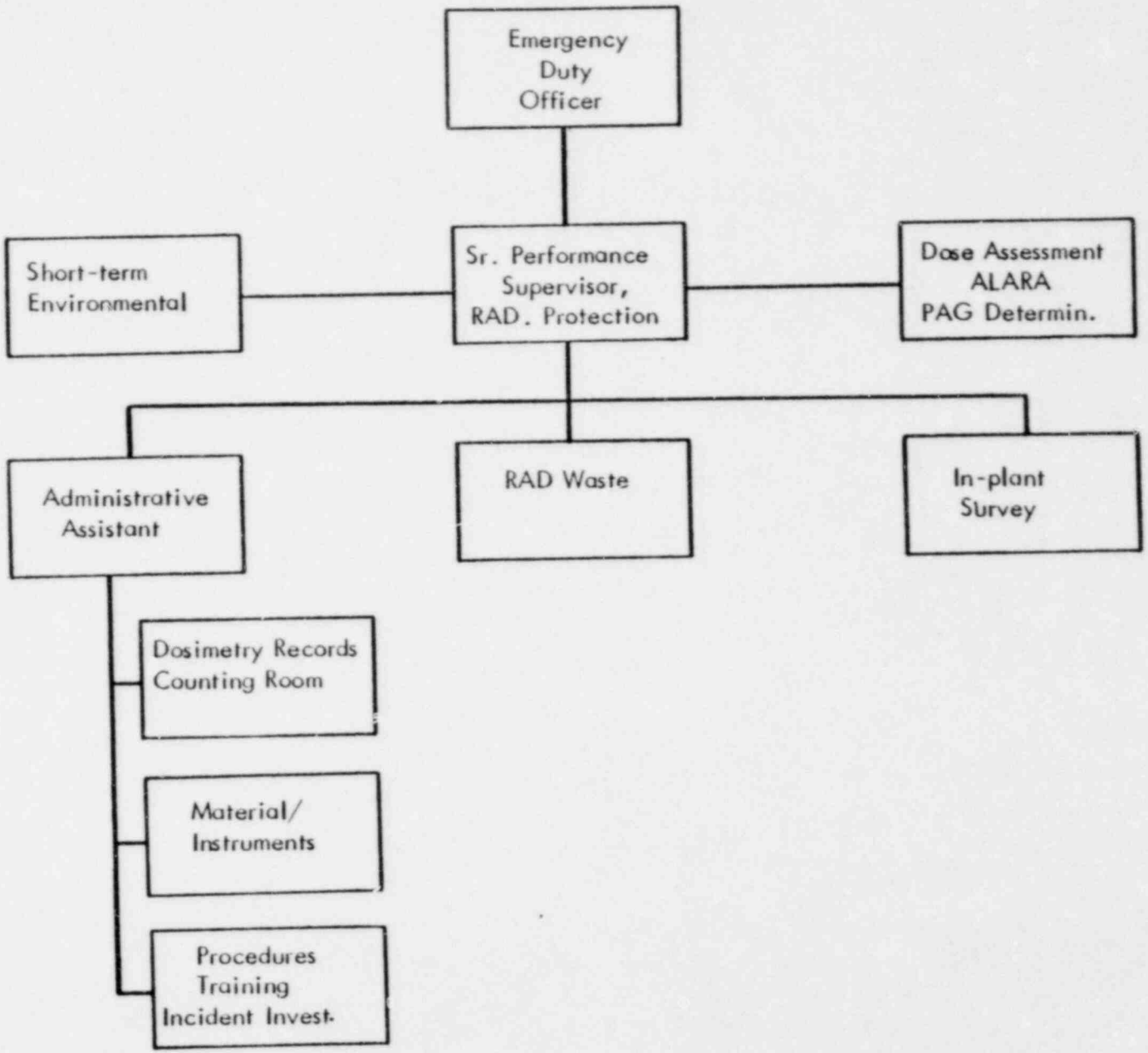

Figure 4

RADIATION PROTECTION - LONG TERM RESPONSE ORGANIZATION
(Chart re-drawn for clarity)

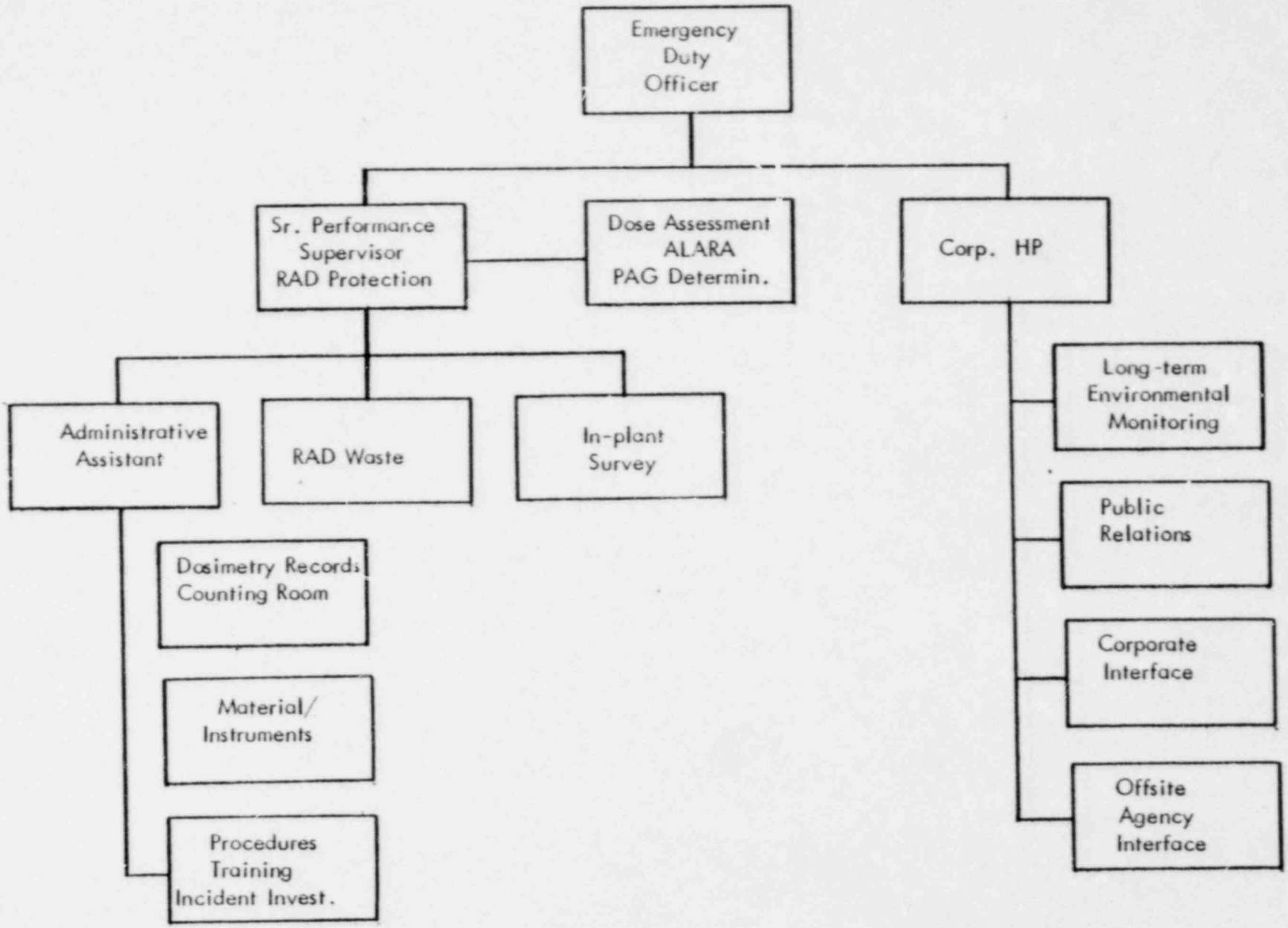

Figure 5

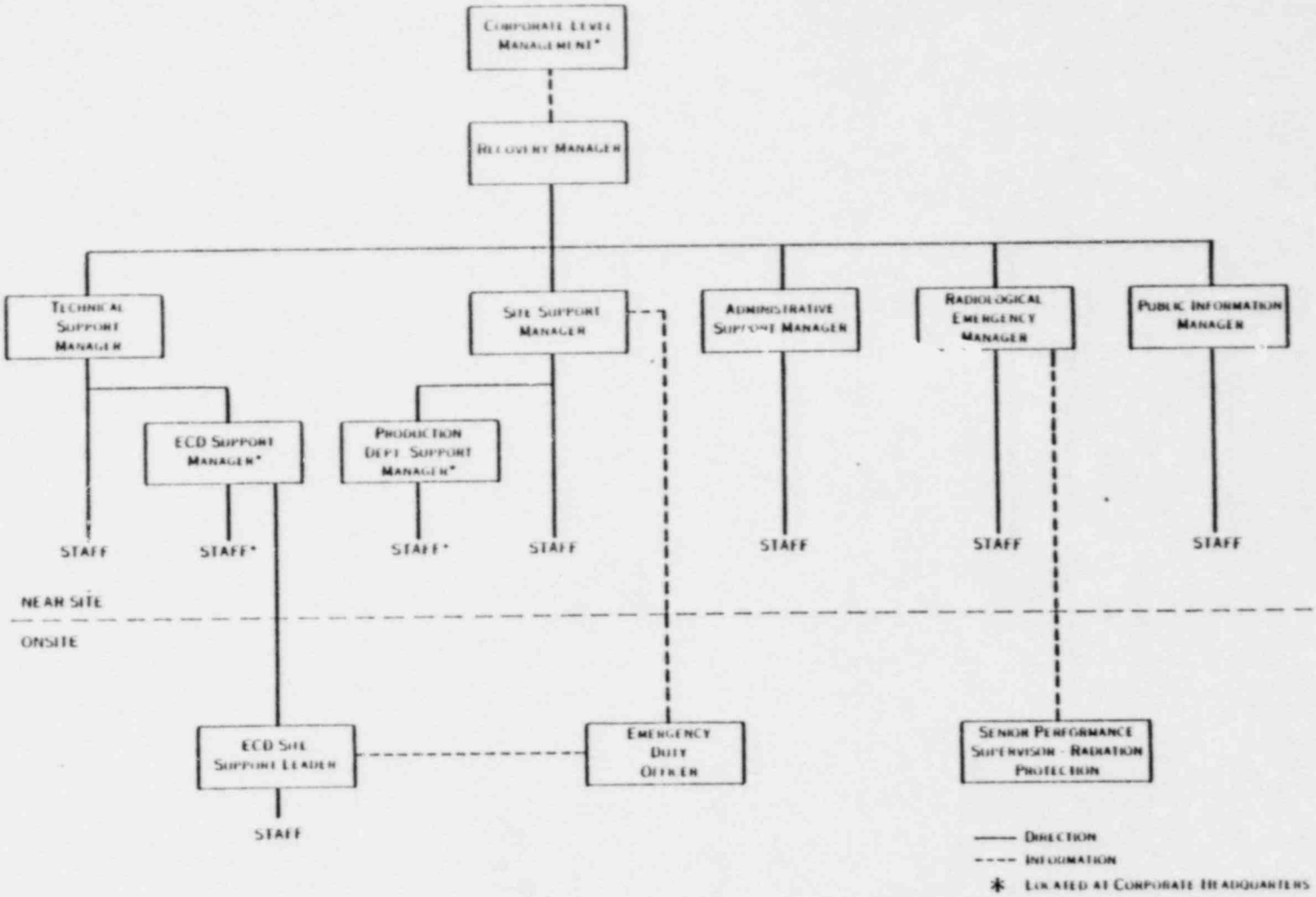

FIGURE XIV-2 RECOVERY MANAGEMENT PLAN EMERGENCY ORGANIZATION

SNGS

UNITS 1&2

Figure 6

ANNEX C

Frederick W. Schneider
Vice President
Production

Public Service Electric and Gas Company 80 Park Plaza Newark, N.J. 07101 201/430-7373

April 24, 1981

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Frank J. Miraglia, Chief
Licensing Branch 3
Division of Licensing

Gentlemen:

EMERGENCY PLANNING APPRAISAL
NO. 2 UNIT
SALEM NUCLEAR GENERATING STATION
DOCKET NO. 50-311

In response to the letter of Mr. Boyce H. Grier of April 7, 1981 (attached), we hereby commit to implement the items listed in the enclosure by May 15, 1981 with the exception of Item 3. Item 3 will be completed by September 1, 1981. This implementation schedule was discussed in a meeting between myself and Brian K. Grimes on April 24, 1981 and is consistent with the Company's commitment to emergency preparedness and the protection of the health and safety of the public.

F W Schneider

Attachment

CC: Mr. Brian K. Grimes
Division of Inspection and Enforcement
U.S. Nuclear Regulatory Commission

A045
S.1/1

8104290511

F

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

Docket Nos. 50-272
50-311

APR 7 1981

Public Service Electric & Gas Company
ATTN: R. M. Eckert, Senior Vice President
Energy Supply and Engineering
80 Park Plaza
Newark, New Jersey 07101

Gentlemen:

This is in reference to the Emergency Preparedness Appraisal conducted at the Salem Nuclear Generating Station on March 23 to April 2, 1981 and to the various discussions of the findings held on April 2, 1981 with you and others of your staff by Messrs. B. K. Grimes and G. H. Smith and members of their staffs.

Based on our appraisal we are enclosing a listing of actions required to remove significant deficiencies in the state of emergency preparedness at Salem Nuclear Generating Station, as discussed with you by Mr. D. Donaldson of my staff. This listing is furnished in advance of the Emergency Preparedness Appraisal Report to enable you to initate prompt corrective actions. Please inform this office when you have completed corrective actions so that a promot follow-up inspection can be conducted.

If you have any questions concerning this appraisal or our findings, we will be pleased to discuss them with you.

Sincerely,

Boyce H. Grier

Boyce H. Grier
Director

Enclosure: As Stated

cc w/encl:
F. W. Schneider, Vice President - Production
J. T. Boettger, General Manager, Corporate Quality Assurance
E. N. Schwalje, Manager - Quality Assurance
R. L. Mittl, General Manager - Licensing and Environment
H. J. Midura, Manager - Salem Generating Station
R. A. Uderitz, General Manager - Nuclear Production

ENCLOSURE

LISTING OF ACTIONS REQUIRED TO ACHIEVE
AN ADEQUATE STATE OF EMERGENCY PREPAREDNESS
AT SALEM NUCLEAR GENERATING STATION

1. Designate a single individual within the Public Service Electric and Gas Company organization who shall be given direct responsibility for and authority over all aspects of the development and maintenance of the emergency preparedness program.

2. Revise the descriptions of the emergency organization in Sections 3.0 and 14.0 of the SNGS Emergency Plan to reflect:

   a. Functional areas of emergency activity, reporting chains (management structure) and interrelationships of the functional areas down to the working level consistent with Table B-1 of NUREG-0654 and Figure III-1 of the SNGS Emergency Plan.

   b. The assignment of licensee individuals (by position or title) and non-licensee individuals or groups to the functional areas of emergency activity.

3. Develop a documented program consistent with AP-14 for qualifying (training) individuals who are selected for assignment to the various functional areas of emergency activity to include, as a minimum:

   a. Lesson plans;

   b. Training objectives to be met;

   c. The means to be used to verify attendee performance against the training objectives; and,

   d. The means to be used to train members of the emergency organization in changes to facilities, equipment and procedures which may occur in the period of time between scheduled training iterations.

4. Provide a listing of licensee personnel (by name) who have been selected and qualified to perform activities within the functional area to which they have been assigned.

5. Verify that the specific licensee and non-licensee groups of individuals assigned to the various functional areas of emergency activity have received training or attained a level of proficiency sufficent to permit them to perform emergency duties assigned in accordance with the response scheme outlined in the SNGS Emergency Plan and specifically defined in the implementing procedures which will cover their emergency activities.

6. Complete the installation of the upgraded monitoring system and demonstrate that samples collected from the plant vent under accident conditions when normal monitoring instrumentation is off-scale or out-of-service, will be representative.

7. Reevaluate the adequacy of the staffing of the OSC in light of organizational changes which occur as a result of action on item 2.

8. Designate assembly/reassembly areas for individuals who may be evacuated from the Salem and Hope Creek sites and/or recalled to augment the response organization during periods of minimal staffing.

9. Specify the procedures, supplies and equipment for monitoring decontaminating persons and vehicles which may be evacuated from the Salem and Hope Creek sites or from other locations known or suspected to be contaminated.

10. Evaluate the equipment needs for supporting repair and corrective action teams and position this equipment at specified locations for use by the teams.

11. Revise the emergency, abnormal and alarm condition procedures to include instructions for classifying emergency/abnormal situations and implementing the appropriate SNGS Emergency Plan Implementing Instruction to ensure prompt detection, classification and initiation of emergency response actions.

12. Review the Emergency Action Levels contained in the SNGS Emergency Plan Implementing Procedures and, as necessary, revise them to provide clear, readily observable, site-specific indications that EALs have been reached or exceeded and interface these EALs, as appropriate with the emergency, abnormal and alarm condition procedures.

13. Clarify the procedures governing evacuation of the Salem and Hope Creek sites to include clear protective action guides and provisions for mitigating any adverse effects which are determined to exist in connection with the use of a single road evacuation route from the site.

14. Develop protective action guides and procedural revisions for protective action recommendations onsite and offsite based on plant conditions.

15. Develop procedures for security under emergency conditions.

16. Develop procedures which will govern the emergency actions of repair and corrective action teams.

17. Develop procedures for gaseous and particulate sampling of the plant vent under accident conditions where the normal monitors are off-scale or out-of-service and the interim sampling equipment installed for that purpose must be used.

18. Develop and implement procedures for reviewing, approving, revising and distributing the documents comprising the emergency preparedness program and its implementation to ensure consistency with the plant technical specifications.

19. Coordinate and demonstrate the interface of the PSE&G emergency organization and its activities with the emergency organization and activities of the NRC Regional Office.

20. Distribute the information prepared for public dissemination regarding the actions to be taken by individuals within the Emergency Planning Zone.

21. Review the SNGS Emergency Plan, Implementing Procedures, and Implementing Instructions to ensure consistency and appropriate interfaces with other procedures. Approve and distribute all documents in accordance with the procedure developed pursuant to item 18.