UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

Report Nos. 50-250/80-17 and 50-251/80-15

Licensee: Florida Power and Light Company
Miami, FL 33101

Facility Name: Turkey Point Units 3 and 4

Docket Nos. 50-250 and 50-251

License Nos. DPR-31 and DPR-41

Inspection at: Homestead, Florida

Inspectors: R. W. Zavadoski — August 1, 1980
R. W. Zavadoski, Team Leader, Radiation Specialist — Date Signed

R. W. Zavadoski for — August 1, 1980
J. R. Wray, Radiation Specialist — Date Signed

Accompanying Personnel: L. Munson, Battelle Northwest
R. Will, Consultant to Battelle Northwest

Approved by: A. F. Gibson — 8/5/80
A. F. Gibson, Section Chief — Date Signed
Fuel Facility and Materials Safety Branch

SUMMARY

Inspection on May 5-16, 1980

Areas Inspected

This special announced inspection involved 469 inspector-hours onsite in the area of health physics including organization, qualifications, training procedures, ALARA programs, external exposure control, personnel dosimeter program, internal dosimetry, respiratory protection, medical emergencies, instrumentation, surveillance and access control, radwaste control, facilities and equipment, re-entry, and in-plant systems.

Results

Of the 16 areas inspected, no items of noncompliance or deviations were identified in 13 areas; 3 items of noncompliance were found in 3 areas.

DETAILS

1. Persons Contacted

Licensee Employees

*C. O. Woody, General Office
*H. E. Yaeger, Site Manager (PTP)
*Pat Hughes, Health Physics Supervisor (PTP)
*J. K. Hays, Plant Manager - Nuclear
*John S. Wade, Jr., Chemistry Supervisor (PTP)
*Edward R. Lapierre, Radiochemist (PTP)
*S. M. Feith, Supervisor QA Operations
*J. E. Moore, Operations Superintendent - Nuclear
*J. Kanouse, Systems & Programming G. O.
*M. Plummer, Systems & Programming G. O.
*J. L. Danek, Health Physics
*T. S. Peck, Health Physics
*R. G. Mende, Reactor Engineer
*T. D. Burkett, Plant Manager - Fossil
*P. J. White, Maintenance Superintendent
*V. A. Kaminskas, Reactor Supervisor
*J. R. Bates, Health Physics
*W. A. Klein, Technical Department
*H. F. Story, Health Physics (Corporate)
*F. Marder, Health Physics
*R. P. McAllister, Site Coordinator for IRM
*D. W. Jones, QC Supervisor
*J. E. Vessely, Director - QA
*T. Essinger, Assistant Manager - QA Operations
*G. D. Whittier, Nuclear Licensing G. O.
*D. L. Hartsfield, PGM
*John E. Powell, Flo. Construction Manager
*R. A. Kaminsky, Nuclear Licensing G. O.

Other licensee employees contacted included 37 construction craftsmen, 48 technicians, 6 operators, 18 mechanics, 12 security force members, and 8 office personnel.

*Attended exit interview.

2. Exit Interview

The inspection scope and findings were summarized on May 16, 1980 with those persons indicated in Paragraph 1 above. The inspectors reviewed and examined all aspects of the health physics program at the facility. This examination included organization, staffing, audits, procedures, training, retraining, exposure control, instruments, access control, ALARA, radwaste surveys and facilities. The inspectors stated that the areas of radiological surveys outside the Radiation Control Area, ALARA review of steam generator

tube plugging operation, procedures for change out of filters on the containment building exhaust and the ventilation flow distribution in the auxiliary building should be reevaluated by the licensee; the licensee agreed to consider a reevaluation. At the exit interview the inspectors also identified items of noncompliance which included: (1) failure to post a radioactive materials area (discussed in paragraph 6.h); (2) unacceptable radiation levels in the unrestricted area (discussed in paragraph 7.c); and (3) failure to perform adequate surveys (discussed in paragraph 7.a, 7.c and 8.c). The plant manager acknowledged the items of noncompliance.

3. List of Unresolved Items, Noncompliance and Inspector Follow-up Items

The following is a summary tabulation of all the unresolved items, noncompliance and inspector follow-up items identified throughout this report. Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve noncompliance or deviations. New unresolved items identified during this inspection are discussed in Section 6. Inspector follow-up items (IFI) are matters which the NRC desires to look into again and which will be examined in future inspections.

(Open) IFI 950-250/80-17-01; 50-251/80-15-01) Reporting recommendations for health physics supervisor (paragraph 4.a)

(Open) IFI (50-250/80-17-02; 50-251/80-15-02) Establishing a formal group with the sole responsibility of ALARA (paragraph 4.c and 9.a)

(Open) IFI (50-250/80-17-03; 50-251/80-15-03) Independent measurements by quality assurance auditors (paragraph 4.f)

(Open) IFI (50-250/80-17-04; 50-251/80-15-04) Organizing and documenting the Health Physics retraining program (paragraph 5.b)

(Open) IFI (50-250/80-17-05; 50-251/80-15-05) Formal listing of qualifications for each health physics supervisor (paragraph 5.d)

(Open) IFI (50-250/80-17-06; 50-251/80-15-06) Preparation of job description for health physics personnel (paragraph 5.e)

(Open) IFI (50-250/80-17-07; 50-251/80-15-07) Closer liaison between the corporate health physicist and the plant (paragraph 5.g)

(Open) IFI (50-250/80-17-08; 50-251/80-15-08) Review of the contents of the training programs (paragraph 5.h)

(Open) IFI (50-250/80-17-09; 50-251/80-15-09) Critiques of nonroutine tasks (paragraph 5.i)

(Open) Unresolved Item (50-250/80-17-10; 50-251/80-15-10) Records of Grade D quality air for supplied air system (paragraph 6.b)

(Open) IFI (50-250/80-17-11; 50-251/80-15-11) Records System for Bullard Type Air Filters (paragraph 6.b)

(Open) Unresolved Item (50-250/80-17-12; 50-251/80-15-12) Air certification for SCBA's (paragraph 6.c)

(Open) IFI (50-250/80-17-13; 50-251/80-15-13) Inspection of emergency supplies (paragraph 6.c)

(Open) IFI (50-250/80-17-14; 50-251/80-15-14) Increasing the computer capabilities for dose control (paragraph 6.d and 9.b)

(Open) IFI (50-250/80-17-15; 50-251/80-15-15) Proper wearing of dosimetry (paragraph 6.e)

(Open) IFI (50-250/80-17-16; 50-251/80-15-16) Performance audits to validate the calibration and performance of TLD systems (paragraph 6.f)

(Open) IFI (50-250/80-17-17; 50-251/80-15-17) Acquisition of a GeLi system for the health physics department (paragraph 6.g)

(Open) Infraction (50-250/80-17-18; 50-251/80-15-18) Failure to label radioactive material containers (paragraph 6.h)

(Open) IFI (50-250/80-17-19; 50-251/80-15-19) General retraining of plant staff for radiation levels (paragraph 6.h)

(Open) IFI (50-250/80-17-20; 50-251/80-15-20) More sensitive instruments for surveys (paragraph 6.i)

(Open) IFI (50-250/80-17-21; 50-251/80-15-21) Laundry survey procedures (paragraph 6.1)

(Open) Infraction (50-250/80-17-22; 50-251/80-15-22) Failure to survey (paragraph 7.a, 7.c and 8.c)

(Open) Infraction (50-250/80-17-23; 50-251/80-15-22) Failure to control radiation levels in an unrestricted area in accordance with 10 CFR 201.105.b.1 (paragraph 7.c)

(Open) IFI (50-250/80-17-24; 50-215/80-15-24) Development of procedures for surveys of areas outside the RCA (paragraph 7.d)

(Open) IFI (50-250/80-17-25; 50-251/80-15-25) Development of procedures for change out of the containment exhaust filters (paragraph 7.d)

(Open) IFI (50-250/80-17-26; 50-251/80-15-26) Methyl iodine testing for charcoal samples from emergency ventilation systems (paragraph 8.b)

(Open) IFI (50-250/80-17-27; 50-251/80-15-27) Evaluation of ventilation flow in the auxiliary building (paragraph 8.b)

(Open) IFI (50-250/80-17-28; 50-251/80-15-28) Hard piping of portable demin system (paragraph 8.c)

(Open) IFI (50-250/80-17-29; 50-251/80-15-29) Procedure for dewatering portable demins (paragraph 8.c)

(Open) IFI (50-250/80-17-30; 50-251/80-15-30) Evaluation of the need for air sampling by compactor (paragraph 8.d)

(Open) IFI (50-250/80-17-31; 50-251/80-15-31) Activity estimation for new compactor (paragraph 8.e)

(Open) IFI (50-250/80-17-32; 50-251/80-15-32) Determination of Groups I and II (paragraph 8.e)

(Open) IFI (50-250/80-17-33; 50-251/80-15-33) Evaluation of present supply of portable instrumentation (paragraph 10.a)

(Open) IFI (50-250/80-17-34; 50-251/80-15-34) Reverification of high calibration point on instrumentation calibrator (paragraph 10.c)

(Open) IFI (50-250/80-17-35; 50-251/80-15-35) Records for air sampler flow calibration (paragraph 10.c)

(Open) IFI (50-250/80-17-36; 50-251/80-15-36) Setting of frisker alarm setpoints (paragraph 10.d)

(Open) IFI (50-250/80-17-37; 50-251/80-15-37) Functional checks of instrumentation (paragraph 10.e)

(Open) IFI (50-250/80-17-38; 50-251/80-15-38) Changes to procedures (paragraph 11.a)

(Closed) Unresolved (50-250/80-11-01; 50-251/80-11-01) Dose Rate Limit for Open Exclusive use Vehicles The inspector reviewed a letter dated February 16, 1979 from the Department of Transportation confirming that the only requirement on dose rate from an open exclusive use vehicle is that it not exceed 10 mr/hour at 2 meters from the vehicle. The inspector had no further questions.

4. Radiation Protection Organization and Management

a. The inspectors reviewed the organizational structure of the plant. Figure 1 shows the overall plant organizations and Figure 2 shows the health physics organization. The organizational interrelationship of the plant with the corporate health physics office was not reviewed during the appraisal as it was already addressed in the St. Lucie Health Physics Appraisal (Report No. 50-335/80-06). At the Turkey Point facility there are two plant managers, one for the fossil units and one for the nuclear units, both of whom report to the site manager.

The nuclear plant manager has a maintenance superintendent, an operations superintendent, a technical department supervisor and a quality control supervisor reporting to him. The health physics supervisor, along with the reactor engineering supervisor, chemistry supervisor, training supervisor and waste handling supervisor, report to the plant manager, nuclear, through the operations superintendent, nuclear. The inspectors pointed out that Regulatory Guide 8.8, March 1977, Revision 2, Section C.1.b.c., recommends that "The Radiation Protection Manager (RMP) (onsite) has a safety-related function and responsibility to both employees and management that can be best fulfilled if the individual is independent of station divisions, such as operations, maintenance or technical support, whose prime responsibility is continity or improvement of station operability." No conflicts due to health physics reporting through operations were ascertained by the inspectors; however, this may be strongly dependent on the people involved. Therefore, the inspectors recommend a reporting chain of the health physics supervisor directly to the plant manager (Inspector Follow-up Item 50-250/80-17-01; 50-251/80-15-01). The inspectors also noted that the chemistry and health physics functions were split at the facility, thereby not diluting the health physics effort. Licensee's representatives informed the inspectors that the primary responsibility for radioactive waste management was in the process of being turned over to the health physics department. The inspectors commented that such a realignment appeared to be prudent.

b. The organization of the health physics department is shown in Figure 2. The entire department presently consists of 32 permanent employees. The health physics operations supervisor's responsibilities is to ensure that the day-to-day operations in the plant are adequately covered. He is also responsible for ensuring that required surveys are taken, instruments are calibrated, and respirators are cleaned and repaired. In addition to all the health physics shift supervisors, a radwaste supervisor reports directly to the operations health physics supervisor. In part, the present function of the radwaste supervisor, is to ensure that solid waste shipments are made in accordance with regulations. The direct responsibility for liquid and gaseous radioactive wastes lies in the chemistry department. The health physics administrative supervisor is responsible for ensuring that all required records are maintained, that dosimetry records are reviewed and adequate, that respirator and employee training are administered and adequate. In addition, he is responsibile for the development of computer programs, which aid the department in gathering, distributing and evaluating raw data necessary for efficient routine daily operations. The staffing and delegation of authority within the health physics department appeared adequate except as detailed below.

c. The inspectors noted that there was no formal structure within the health physics organization which had overall responsibility for ALARA (i.e., maintaining plant personnel radiation exposures as low as reasonably achievable). From discussions with the plant manager, the health physics staff and other plant personnel, and through direct observation, the inspectors concluded that many elements of an ALARA

program were present and functional. For example, the steam generator mock-up located in the radwaste building represented a significant commitment to ALARA. Not only did the mock-up represent realistic dimensions of scale, height (platform included) and sturdiness (it is fabricated of steel), but also included an expensive extra set of tools and jigs dedicated solely to training. The portable air filtration units (approximately 1,000 cfm) for steam generator ventilation also represents another major licensee commitment to ALARA. However, the problems discussed in Section 7 of this report i.e., explosive steam generator tube plugging which led to contamination of areas outside the Radiation Control Area (RCA) and collapse of the CVCS Holdup Tank which led to the contamination of several electrical vaults outside the RCA, potentially could have been avoided if a radiological engineering group had been looking out for such problems. Therefore, based on their judgement and observation the inspectors recommend the establishment of an ALARA coordination group (or radiological engineering group) with sole responsibility for implementating ALARA programs and unencumbered by other responsibilities (Inspector Follow-up Item 50-250/80-17-02; 50-251/80-15-02). Additional findings and comments on the ALARA program at Turkey Point are discussed in detail in the ALARA section of this report.

d. Communications at the facility seemed adequate within the plant health physics staff. For example, a direct link between the health physics shift supervisor at the health physics office and the health physics technician at a steam generator control point inside containment was maintained anytime platform work was in progress. It was also apparent to the inspectors that considerable health physics preparation had been made for the outage. The inspectors reviewed the health physics operations log books and witnessed several shift changeovers and observed that pertinent information was transferred from shift to shift. The inspectors also noted that the health physics supervisor was present for many of the shift turnovers to extract difficulties which required resolution beyond the health physics department.

e. The inspectors noted that health physics coverage is provided twenty four hours a day, seven days a week for both normal operations and outages. The permanent staff is augmented by health physics rental technicians (commonly referred to as rent-a-techs) during outage situations. For the present outage, the plant employed some 25 senior rent-a-techs and an additional 15 to 20 junior or decon technicians. The inspectors found the staffing for the outage and the supervision of rent-a-techs by permanent plant employees adequate to meet the demands.

f. The health physics program at the site is audited by the corporate quality assurance group. The inspectors reviewed the results and findings of the quality assurance audits for 1979 and 1980. The inspector also discussed the quality assurance health physics audits with the quality assurance auditors and found that the health physics program is continuously being audited. From discussions and review of

reports, the inspectors noted that the depth and degree of attention of quality assurance to the procedural and performance elements of the health physics program were commensurate with an adequate quality assurance function. Quality assurance personnel did not carry health physics type instrumentation during the conduct of their audits. The inspectors stated that their effectiveness could be enhanced if they could make independent measurements (Inspector Follow-up Item 50-250/80-17-03; 50-251/80-15-03). In the professional judgement of the inspectors, the scope and depth of the quality assurance audit program of health physics activities at Turkey Point is adequate.

g. The inspectors found the organization at Turkey Point to be acceptable. Based on the inspector's professional judgement, improvements to the organization of the health physics program could be obtained if licensee consideration is given to: (1) changing the reporting chain of the health physics supervisor (paragraph 4.a); (2) establishing a group with the sole responsibility of ALARA (paragraph 4.c); and (3) allowing the quality assurance auditors to make independent measurements (paragraph 4.f).

5. Personnel Selection, Qualification and Training

a. The basic plant personnel selection criteria are those found in ANSI N18.1-1971, "Selection and Training of Nuclear Power Plant Personnel". Health Physics Procedure HP-80, "Qualification of Health Physics Personnel" (dated February 17, 1978) sets forth the further qualifications required at the Turkey Point plant. A "Health Physics Qualification Guide" is utilized and consists of eight sections each specific to a major area of HP concern. Within each section there are specific items which must be discussed with, or demonstrated to, the appropriate level of supervision. The supervisor initials and dates each item as it is successfully completed, and each section is reviewed by the HP Supervisor. Upon completion of the Qualification Guide, a candidate is given a comprehensive oral and written examination. If successful in all respects, the candidate is designated fully qualified to perform all HP duties without supervision. Beyond the qualifications listed, there are those for two related levels---junior and senior technician. The former, in accordance with ANSI 18.1, 45.2 "Technicians", shall have a minimum of two years' working experience. The latter should have four years working experience in accordance with both Plant and contractor requirements. The licensee hires only at the senior technician level for technicians in responsible positions. There is an unwritten, but firmly adhered-to policy at the plant that only candidates whose capabilities are known to a staff member will be hired. As evidenced by the apparent quality and level of expertise of health physics personnel, this policy, and the comprehensive qualification review procedure (HP - 80) are effective in obtaining qualified technicians.

b. The inspectors reviewed the refresher training of health physics personnel. Ten hours of refresher training per year are required.

The inspectors found no documented training plan, no time scheduled, nor recorded evidence of what and how much training any individual has received. There is no offsite training afforded health physics personnel at any level below that of the Corporate, and very occasionally for the Health Physics Supervisor. State-of-the-art information that may have been gained by attendance at Health Physics Society meetings, conferences and seminars does not appear to have been disseminated to plant health physics personnel on any formal basis. In the professional judgement of the inspector the unusual hiring practices and the ability to obtain and maintain quality personnel mitigates the effect of an unorganized retraining program. The inspectors recommended that consideration of a formal and documented refresher and updating training program should be initiated (Inspector Follow-up Item 50-250/80-15-04; 50-251/80-17-04).

c. The inspectors ascertained that the health physics supervisor (HPS) meets the qualifications set forth in paragraph 4.4.4, ANSI 18.1-1971 and Regulatory Guide 1,8 Section C for Radiation Protection Supervisor Manager, and Flordia Power and Light Turkey Point Operations Procedure 11500, Health Physics Manual, 3.3.1.2. The incumbent was employed in plant operations prior to transferring to radiation protection and is well versed in the technical specifications and nuclear operations of the facility. The job description for the HPS position appears to be a brief but adequate listing of the overall duties. It does not indicate lines of authority or delegation of responsbilities. The incumbent is recognized as being a "field" man-personal supervision and observation of HP activities throughout the plant--rather than an office man. The routine office functions commonly associated with an HPS are rested in the Adminstrative Supervisor. In the professional judgement of the inspectors the supervisor and management of the health physics department is adequate.

d. There are two levels of supervision below that of the HPS. The first consists of Operations Supervisor, HP Steam Generator Replacement Project Supervisor, and Administrative Supervisor. Under the Operations Supervisor, there are the Day Shift Supervisor, Peak Shift Supervisor, Mid Shift Supervisor, Fourth Shift Supervisor, Radwaste Supervisor, and the Refueling Operations Coordinator. None of the foregoing is less than a Senior Plant Technician Level. Qualifications for all of the foregoing are those set forth in ANSI 18.1-1971, section 4.5.2, as implemented by HP Procedure HP-80. All the individuals listed above were found to meet the qualifications specified. In the professional judgement of the inspectors, a recommendation was made that the licensee establish a formal list of qualifications for each health physics supervisor and typical senior technician independent of ANSI 18.1-1971 (Inspector Follow-up Item 50-250/80-17-0;5 50-251/80-15-05).

e. The inspectors reviewed job descriptions of specific health physics positions. They do not appear to be consistent in detail, depth or format. Only a few appeared to reflect the actual duties and responsibilities of the incumbent related to specific qualifications for the job in question. For example, the job description for the HP Administrative Supervisor does not reflect the need for the individual to be a qualified HP as the functions described are clerical in nature and no mention is made of his direct supervision over training, bioassay, dosimetry, or his need for technical expertise in the area of review and analysis of exposure data. As another example, a generic job description for HP Shift Supervisor was available, as was one for Fourth Shift Supervisor and the Refueling Coordinator. None of these relate to qualifications and, at best, are brief and vague. A supporting job description for the HP SGRP Supervisor was not available, because the position was newly established. The Operations Supervisor position has been changed, primarily to include radwaste operations, and the description would be nearly that for the plant HP program supervisor. Job descriptions were available and reviewed for those positions shown on Figure 2 as "Biossays", "Red Badge Respirator Training," "Records Clerk, Personnel Dosimetry," and for an "Administration Assistant, Personnel Exposure Records." It was not evident that there was clear separation of the duties of the Records Clerk and the Administration Assistant, Personnel Exposure Records. Based on their judgement the inspectors recommended that the job descriptions for each member of the health physics staff should be prepared in a consistent format and to a depth that adequately describes each persons duties (Inspector Follow-up Item 50-250/80-17-06; 50-251/80-15-06).

f. The qualifications for senior contractor technician level personnel are essentially the same as those for plant personnel as set forth in ANSI 18.1-1971, NRC Reg. Guide 1.8. An entry level technician is also supplied by contractors, i.e., decontamination technician. There are essentially no qualifications for this class. It does, however, provide a means whereby an individual may acquire the two years of experience necessary to qualify as a junior technician. Contract personnel (senior technicians only) are, in addition to the red badge (security and general health physics practices) course and test, given an examination. The cover sheet states "This examination is given to ascertain what can best be described as a general evaluation of your capabilities as a technician" and is the plant counterpart of the Qualification of HP Personnel (HP-80) assessment for plant personnel. The exam is not graded numerically.

The inspectors reviewed the qualifications of a number of contract personnel (primarily junior and senior technicians) and determined that the qualifications met or exceeded the standards. The consistency and familiarity of the HP contractor personnel were verified in the fact that a high percentage (about 50%) of the Contractor HP "rent-a-tech's" request to, and do, return to the plant each year, and that many permanent plant HP personnel have had previous assignments there as contractor technicians. In the opinion of the inspectors, the contract personnel are well qualified.

g. The inspectors reviewed the health physics training program at Turkey Point. All permanently assigned personnel are required to successfully complete a radiation safety training course. Vistors (all personnel who are not Flordia Power and Light Company (FP&L) personnel permanently assigned to Turkey Point) may also receive health physics training, the "Red Badge Course" and be allowed to take the written examination for unescorted entry into the Radiation Control Area (RCA). Vistors with adequate education, training and experience may take the portions of the course pertaining solely to plant procedures and the examination. Health Physics (HP) personnel must complete the qualifications program as set forth in Procedure HP-80, qualification of Health Physics Personnel. Contract HP personnel are given an examination described as "a general evaluation of your capabilities as a technician". Review of the examination indicates that it is fairly comprehensive and is adequate for the purpose intended.

On a routine basis, there are eight training courses in health physics given at the plant. Two of these are based on the classification of the personnel and to which department they are assigned.

1. A "Group A" course is given for employees assigned to operations, nuclear, maintenance, radiochemistry, health physics, quality control, nuclear training, security, electrical, instrument and control, technical, reactor engineering, power plant testing, relay, power plant construction and quality assurance. The course consists of approximately 20 hours of classroom lecture and demonstration and examination.

2. A "Group C" course is given for new employees assigned to any department other than those listed under the Group A class. It consists of 4 hours of classroom lecture on basic health physics. There is no examination.

3. A third course--Refresher Training for Group A personnel is given. It consists of 8 hours of orientation toward the maintenance aspects , covering use of instruments, radiation work permits, respiratory protection, decontamination, entry and exit procedures, exposure and contamination limits, etc. Basic health physics is not reviewed. Returning employees (within two years or less) or those who have completed health physics training at another FP&L facility may be exempt from the basic training at the discretion of the Health Physics Supervisor (HPS). Those who have not been through refresher training for more than 2 years are required to be retrained and/or satisfactorily complete the written refresher examination.

4. The Health Physics (HP) personnel who are permanent employees must be certified by the HPS, based on successful completion of qualifications by permanent HP personnel. This procedure requires that the new person "Must demonstrate adequate knowledge and/or ability consistent with the particular section of the Guide and with his position (i.e., RPM or Shift Supervisor). Each section is initialed and dated by a qualified shift supervisor. Upon completion of each section the individual is given an oral or written examination.

If satisfactory, the HPS will sign off, section by section, and finally designate the individual as fully qualified to perform all health physics duties without supervision.

5. Refresher Training for HP Personnel consists of approximately 10 hours of lecture, demonstration, and practical exercise covering most aspects of health physics.

6. HP Orientation for Contract Personnel consists of two hours of a highly condensed version of the group A course. Apparently, it is assumed that these contract personnel (Westinghouse, Bechtel, ANS, etc.) have adequate training and experience in radiation protection and that orientation to plant specific practices is sufficient.

7. A Control Center Operator Class in HP is given. The lesson outline for the training indicates that it is a more sophisticated coverage of all the basic elements of the Group A course, and extends to practical exercises and problems involving time, distance and shielding, as well as discussions of selected sections of 10 CFR 19, 20, 55, and 100.

8. The last of the eight scheduled courses is the Emergency Radiation Team Class, consisting of four hours of instruction covering the Emergency Organization, organization and responsibilities of the Emergency Radiation Team, evacuation, equipment, injuries, and includes a workshop in typical emergencies.

In addition, annually the HP and Nuclear Operations departments conduct a cross-training course. HP trains Nuclear Operations in such things as air sampling, surveys, ect., and in turn, Nuclear Operations trains HP in emergency procedures. This is scheduled and there is no documented lesson plan. It appears to be fairly comprehensive "refresher type" training. All permanent plant employees are included in the initial training program, either in a Group A class (individuals who have any potential for exposure or contamination in their job routine) or in a Group C class (typically managers) as appropriate.

Initial training is required of all personnel, plant, contractor and vistor, who are engaged in work of any type at the Unit 3 and 4 site. Retraining is required for all personnel on a biennial basis. The content and duration of the refresher courses are based on the initial training received.

There is no HP Manual requirement that states that the corporate health physicist (CHP) should coordinate seminars for HP no less than annually in the area of current HP practices and policies. In the inspector's opinion, this is one weakness at the plant. Historically, plant personnel have not been afforded the opportunity to attend seminars or conferences offsite. In addition, it appears that CHP has not kept all plant HP personnel abreast of the information which he or his immediate staff gleans from attendance at professional and technical meetings. Over the long term this could result in a deterioration of

HP personnel quality. In essence, it is apparent that closer liaison between the CHP and the plants would be most beneficial (Inspector Follow-up Item 50-250/80-17-07; 50-251/80-17-07). There was no evidence of special training for unique activities. The inspectors was advised that there were no formal post-operations de-briefings or critiques, especially for non-routine jobs nor were there "all staff" discussion periods in which HP activities were discussed on a routine basis. Much of the information is conveyed informally.

h. The training class which was observed was for "steam generator jumpers" and, as such, required a very limited sphere of knowledge. Orientation to other departments (maintenance, operations, ect.) was not observed. Verification of satisfactory completion of training is adequate since the information is furnished in a timely manner on the "Computer Training Base". Site Procedures (Health Physics procedures) are touched upon very lightly in discussions. However, the video tape and practial exercise emphasize the procedures graphically, resulting in adequate instruction.

After observation of the 20-hour steam generator jumper course, the inspector noted the entire subject of instrumentation, capabilities and limitations, purposes and uses, did not receive much attention. It is recognized that the class observed was not for permanent employees and that time restrictions (20 hours for lectures, discussions, video tape, demonstrations, examinations, and respirator training and fitting) do not facilitate in-depth training in any one area of concern. However, the personnel are under close scrutiny at all times by trained health physics technicians and therefore, the training can be considered adequate.

The inspectors recommended that a review and assessment, including a test of results mechanism, be made of the training programs. Preferably the review team should have at least one non-FP&L member with expertise in training methods, the Corporate Health Physicist and in-plant departmental representation (Inspector Follow-up Item 50-250/80-15-08; 50-251/80-17-08).

i. The inspectors noted that while there has been no documented, planned cross-training, the overall capabilities and previous experience of personnel appeared adequate. Depending upon length of time at the plant, about 50% of the HP personnel have served in several different capacities over the years. The routine scheduled tasks and operations appear to be performed with frequency sufficient to maintain competency. As was pointed out above, unusual tasks or situations are not critiqued nor presented as the subject of regularly scheduled staff discussions. It is the inspector's judgement that such critiques or discussions would help to maintain a degree of competency in the area of non-routine tasks (Inspector Follow-up Item 50-250/80-15-09; 50-251/80-17-09).

j. The inspectors found the personnel selection, qualifications and training at Turkey Point to be acceptable. However, based on the inspector's professional judgement, improvements to the program could be obtained if licensee consideration is given to: (1) refresher and updating training program for health physics technicians (paragraph 5.b); (2) a formal list of qualifications for each health physics supervisor (paragraph 5.d.); (3) a detailed job description for each member of the health physics department (paragraph 5.e); (4) a closer liaison between the corporate health physicist and the plant (paragraph 5.g); (5) a review of the contents of the training program (paragraph 5.h); and (6) routine critiques for non-routine tasks (paragraph 5.i).

6. Exposure Controls

a. The respiratory protection program was reviewed by the inspectors for training, content and adequacy including: medical content, respirator fit program, cleaning and decontamination methods, inspection and testing, repair, packaging and storage, and inventory. The respiratory protection training encompassed approximately 1-1/2 hours and included the requirements of NUREG-0041. The program utilized primarily video-tape presentations, but did include live lectures and demonstrations of appropriate methods of inspections and donning of equipment. Upon completion of the classroom sessions, the student is requested to read and sign a document stating the primary requirements of the respiratory protection program and his signature indicates that he has read and understood those limitations. This document is maintained as a record indication of respiratory protection training. No formal written examination is given. An examination to determine fitness for the purpose of wearing respiratory protective devices is conducted by a medical technician and results reviewed and signed by a local physician. A medical examination is required prior to authorization to wear respiratory protection and annually thereafter. The examination consists of completing a one-page medical history questionaire, blood pressure check, ear, nose and throat medical check, aural examination of lung and heart actions and lung capacity check. The lung capacity graph is attached to the medical record and both are maintained as permanent files. The primary criteria for non-approval is lung capacity readings of less than 80 percent of the norm for age and body size.

The respiratory fit program utilizes a sealed booth to perform quantitative tests of individual respirator fits. The equipment uses a NaCl challenge atmosphere. Each individual is instructed in donning the respirator. A standard Scott respirator is utilized for the test. The booth attendent visually checks the fit and observes a negative pressure leak test. The individual to be tested enters the booth and attaches a hose to the internal test fittings. The operator samples the booth atmosphere and adjusts the equipment to read 100 percent at that concentration. The equipment is cleared and the measurement range is reduced such that a full scale will be equal to 10 percent of the booth concentration. Leakage indications of less than one percent are required for a successful fit. The procedure for conducting the test was posted and followed. A chart recording test result is

completed and indicates the name and social security number of the individual, the machine parameters and the tracing of the machine indicated concentrations for each of the phases of the test. This chart recording is retained as a permanent record. Respirator refit is scheduled on a two-year frequency.

Upon completion of respirator training, medical examination, and respirator fit, the records are reviewed and approval for respiratory protection wearing is authorized if all records so indicate. Authorization to wear respiratory protection is then entered into a computer program and printed out routinely on the current radiation exposure report. A flagging system is in place to indicate rescinding authorization to wear respiratory protection when any of the required frequencies have been exceeded. Respirators are issued by HP for specific jobs as covered by an RWP. Issuance of a respirator is made only after physically reviewing the current radiation exposure report and verifying that an individual is qualified to wear respiratory protection equipment.

b. The respirator cleaning, decontamination and drying station is located in the new radwaste facility. Bagged respirators are delivered to this facility where they are brushed and then placed in a dishwater type-cleaning machine, washed twice in the machine--once face up and the second time face down-then hung for air drying. Procedures are posted in this facility giving instructions on the demonstration methods, materials and procedures. The cleaned respirators are then delivered to the HP respirator station where they are inspected surveyed, smeared and disinfected. Masks requiring repair are tagged and sent to the HP repair facility. Acceptable masks are tagged and sealed in plastic bags in preparation for storage or issuance.

Each respirator has a unique number attached on a brass tag. At the inspection and bagging station a record is kept of each respirator that is inspected and its condition noted. Maintenance and repair records are maintained on each individual respirator in a card file in the respirator repair facility. Several respirators were removed from the station and from the stand by storage station and independently checked for radiation levels, condition and contamination levels. No unacceptable conditions were detected. A system has been established whereby respirators found contaminated near acceptable limits (1000cpm per 100 sq centimeters or 1.5 mR/hr) are re-marked as special use and maintained for high level contamination work, i.e., steam generator work. If the contamination or radiation levels on the respirator are above 1.5 mR/hr, the respirators are discarded as waste.

The supply of respirators was reviewed for adequacy. Approximately 355 regular Scott respirators, 15 new Scott lightweight and 47 Scott welding masks are in a rotating use system. A backup supply of approximately 300 new Scott respirators is available onsite. A comprehensive supply of repair parts for the Scott respirators was available on site. A supply of bubble air-supplied hoods was also available and air tubes for use with the Scott respirators when used as a supplied-air unit. The air tubes are a single use item and are

discarded as radioactive waste because of the inability to assure internal cleanliness of the tube. The breathing air system used in reactor containment is supplied from four oil-less air compressors leased specifically for this purpose. A breathing air piping system delivers air to selected locations in the reactor containment. The air is then fed to a Bullard filter manifold. NIOSH-approved fittings, hoses, and respiratory devices are used.

Health Physics Procedure HP-65, Maintenance, Accountability, Cleaning, Inspection, Repair and Storage of Respiratory Protection Equipment, indicates that supplied air should be of grade D quality. No records were available to indicate quality of air provided and no routine sampling of supplied air is provided. However, the licensee representatives were still attempting to locate the records (Unresolved Item 50-250/80-17-10; 50-251/80-15-10).

The above procedure also specifies, "Air reducer/distribution device (Bullard type) should be checked prior to each installation for use and after repairs." No record is maintained of this check. Discussions with the licensee personnel indicated that this check and filter change is made prior to each outage and a sticker placed on the device to indicate the check has been completed. Two devices were noted in Unit 4 reactor containment which had no sticker visible. A system should be implemented which will assure that these units are acceptable for use (Inspector Follow-up Item 50-250/80-17-11; 50-251/80-15-11).

c. Self-contained breathing apparatus (SCBA) is used at the facility for emergency use. The air tanks of this equipment are refilled at the facility. Air for this refilling is provided by a commercial vendor. No record of certification of air quality was available for these tanks at the time of the inspection. However, licensee representatives stated the air was certified and were attempting to locate the record. Labels on the tanks indicated oxygen percentage and nitrogen percentage, but no other certification of air quality. It is recommended that certification of air quality from the vendor be procured and maintained at the site (Unresolved Item 50-250/80-17-12; 50-251/80-15-12). Health Physics Procedure No. HP-90, Inventory of Emergency Equipment, provides for inventory of emergency equipment required on an annual basis and preferably on a monthly basis.

Inspection of SCBA units in the respirator supply station and in the reactor control room indicated that monthly inspections were being made. However, masks in the SCBA containers indicated tags up to two years old. Discussions with licensee representatives indicated that inspections did not include removal from the bag of face pieces for inspection. The inspector recommended the removal of the respirators from the bags for an adequate inspection to meet the intent of Health Physics Procedure HP-60, Respiratory Protection Manual, section 13.1 (Inspector Follow-up Item 50-250/80-17-13; 50-251/80-15-13). With this exception, the inspection and record of inspection of the emergency respiratory equipment appeared to be adequate.

d. The inspectors reviewed the licensee's program for external exposure control. The overall dosimetry program at the Turkey Point facility is described in the Health Physics Manual. Personnel doses are maintained in accordance with 10 CFR 20.101 and 20.103 limits for both external control with suitable plant administrative control in place to provide some margin of safety for personnel exposures. Flordia Power and Light Company does utilize the banking concept, i.e., 5 (N-18) for workers, both permanent and temporary. Paragraph 4.3 of the Health Physics Manual states that all permanent personnel dose records for external dose is by use of thermoluminescent dosimeters (TLD). An airborne monitoring program is used for internal exposures and bioassay and whole-body count results are used for internal dose. Paragraph 4.3.1 of the health physics manual contains the details of the TLD program. All processing is done at the general office in Miami on a monthly basis except for potential high exposures which are to be processed immediately.

Paragraph 4.3.2 of the Health Physics Manual describes the self-reading pocket dosimeter system, their prime system for providing daily external exposure control. Each person entering the radiation controlled area has a permanent TLD and is issued a self-reading pocket dosimeter by the security guards at the control point. A sign prominently displayed requests each individual to assure that the self-reading pocket dosimeter reads zero before entry into the RCA. Each employee, upon exit from the radiation control area, is required to give the security guard at the exit point his dosimeter number (TLD), the self-reading pocket dosimeter reading, and the RWP for the work he was performing. This information is entered by computer terminal by the guards onto cassette tape, and a hard copy is also provided. Errors or changes at the control point result in a second entry. No corrections other than a re-entry can be made at this point. During outages, twice per day the cassette tape is removed and inputed into the health physics whole-body counter computer. This computer printout is then hand checked against the hard copy from the security printout and errors and changes hand-written on the printout. A corrected copy from the health physics whole-body counter computer is then hand inputed into the Miami computer data base. A hard copy printout of accumulated exposures is received back from the Miami computer and copies posted and distributed to supervisory personnel, health physics personnel, the security guards at the entrance to the RCA and posted in the corridor at the entrance to the RCA. The printout includes a section listing personnel who are excluded from the radiation control area because of exceeding limits, and a listing of personnel who have reached 80 percent of an extension limit administrative guideline, as well as a listing of current exposures of all personnel. Also available, is a computer printout of Exposure Use by RWP, job and trade category. This Exposure Use printout is available to the health physics supervisor. It is recommended that consideration be given to developing a computer system with a direct tie in to the corporate exposure data base (Inspector Follow-up Item 50-250/80-17-14; 50-251/ 80-15-14). This would reduce the number of hand computer entries required with a commensurate reduction of potential error points.

e. The inspectors observed on numerous occasions workers consulting the twice daily updated computer exposure records posted in the corridor at the entrance to the RCA. The posted records were subdivided into various trades and consultants. Discussions with individual workers indicated that they were able to comprehend the information presented. Further discussion with various job foremen and supervisors indicated that they frequently reviewed the radiation exposure lists for their particular department and utilized the information contained on the list to evenly distribute the exposure the members of their group received.

Florida Power and Light's Health Physics Manual, Chapter 6, Personnel Exposure, specifies the company's exposure guidelines. The guidelines are: 500 mrem/week whole body, etc., (paragraph 6.1.1.2) with exceptions. The exceptions (paragraph 6.1.1.3) are: extensions to 800 mrem/week without NRC form 4 and 1000 mrem/week with it and with the approval of the health physics supervisor. With the completed NRC form 4, over 1000 mrem/week can be given when requested by the individual supervisor and approved by the HP supervisor with prior notification of the plant superintendent and/or plant manager. Doses for women should not exceed 500 mrem during any two consecutive months. This, too, can be extended if she and her supervisor request it, the HP supervisor approves it and prior notification is given to the plant manager. Paragraph 6.1.1.3.2, further states that no individual shall be allowed to enter the radiation control area when their dosimeter (self-reading pencil) results indicate a quarterly dose of equal to or greater than 800 mR (2150 mR with completed NRC form 4) until his TLD is read, reported and verified. If his TLD indicates less than 1000 mrem (2750 mrem with completed NRC form 4) he may be allowed back in the radiation control area. His dose is to be monitored closely until he reaches either 1000 mrem or 2750 mrem at which time he shall not be allowed within the radiation control area except for emergencies. In the case of an emergency the Health Physics Manual states that an individual may receive up to 25 Rem whole body dose in order to prevent a serious injury or to prevent destruction of equipment which could result in a serious injury or up to 100 Rem whole body for life saving actions. In any event, every effort shall be made to insure doses to not exceed either 1250 mrem or 3000 mrem.

TLD results are recieved monthly from processing in Miami. A review for correlation between pocket dosimeter records and TLD dose records is made at that time. A variation of ±25% is investigated. Neutron dosimetry consists of an albedo neutron dosimeter issued to an individual going into areas where neutrons are expected. Daily neutron dosimetry control is provided by dose rate versus stay time calculations. Calculated neutron doses are recorded and entered in the daily computer printout for inclusion in the current radiation exposure report issued twice daily.

A quality assurance audit of wearing of dosimeters made prior to this appraisal recognized a problem with the correct wearing of dosimeters. From inspectors observations, this finding is valid and continued

corrective action should be emphasized. Discussions with licensee representatives indicated they were well aware of the problem and were implementing corrective actions. (Inspector Follow-up Item 50-250/80-17-15; 50-251/80-15-15). In summary the inspectors found the external exposure control program to be acceptable if consideration is given to recommendations stated above.

f. The system for control, drift check and source checks of personnel dosimeters (pocket dosimeters or pencils) was reviewed. Drift and source checks are made each 6 months and/or after dropping. Source checks are performed with a certified source to predetermined exposures. The dosimeter must fall within +15% to successfully pass both tests. Dosimeters not passing these tests are removed from service. Documented records of drift checks and source checks were available and complete. This program is comparable to that suggested by ANSI N13.5. All pocket dosimeters are maintained at the entry to the radiation control area by security personnel. Dosimeters are re-zeroed by security personnel and placed in receptables for reissue. Any off-scale or unusually high readings are referred to the health physics supervisor for investigation. Investigations are documented and consist of discussions with the individual as to his actions and locations of potential exposure and comparisons with other personnel in the same locations as that individual and independent HP surveys of areas where the individual had been. Dosimeters with questionable results are removed from service until rechecked and recalibrated.

All beta-gamma TLD's are issued by Health Physics. Permanent personnel have the TLD's attached to their security identification card and when not in-plant the TLD's are stored at the entrance to the protected area. Neutron TLD's are stored at the entrance to the radiation control area and are issued as required. Records of neutron badge numbers and identification of neutron TLD recipients are maintained by security and each badge is issued to only one individual for the monthly period. Normal exchange period for both beta gamma and neutron TLD badges is monthly. All TLD's are read out at the general office om Miami. Control for background dosimeters are maintained at each TLD storage location. These badges are returned with the used badges to Miami where the control badges are averaged and one reading is given as the background for all TLD's. Based on the movement of TLD's from issue points to storage locations, this appears to be an acceptable compromise for background determination.

From discussions with licensee representatives the inspectors determined that there are no dosimter performance audits or checks. The only audit is a quality assurance procedural audit at approximately annual periods. The inspectors recommend that there should be initiated performance audits to validate the calibration and performance of TLD systems as per ANSI N13.11 (Inspector Followup Item 50-250/80-17-16; 50-251/80-15-16). In summary the inspectors found the personnel dosimetry program at Turkey Point to be acceptable, but recommended improvements outlined above.

g. Health Physics Procedure HP-66, Selection, Use, Control and MPC Hour Accountability of Respiratory Protection Equipment, defines the requirements for MPC hours accountability. In practice, MPC accountability is only maintained for unusual or accident conditions. Any entries into air concentrations above detection limits require the wearing of respiratory protection. For those instances where personnel are exposed to airborne contamination levels without respiratory protection or if the levels exceed the protection factor of the respiratory protection equipment worn, MPC hours are caluclated and recorded. These records are maintained in personnel folders. Air sample filters are counted by HP, and results logged in both a sequential logbook and on individual air sample forms. The air sample forms are reviewed by the health physics supervisor. Air samples for iodine collection (activated charcoal cartidges) are counted by the chemistry department on a GeLi detector and isotopic analysis completed by them. Depending upon the work load of the chemistry department this practice could result in delays of work while determining air concentrations. Discussions with licensee represnetatives indicate that plans are in progress to provide a GeLi detector and counting capability to the health physics organization. The inspectors recommended a speed up in the accquistion of the GeLi system for the health physics department (Inspector Followup Item 50-250/80-17-17; 50-251/80-15-17).

An in-house whole-body counter is used to establish baseline data for new employees, support for the air sampling program and evaluation of suspected or actual uptake of radioactive material. The counting system is composed of three main components: (1) a chair counter with detectors, high voltage sources and milti-channel analyzer detection group, (2) a secondary computer used to record on cassette tape the spectral data from the calibration background and personnel counts, and (3) a Hewlett Packard 9830 computer with memory system and impact printer for the data analysis and reporting. The system utilizes three detectors; one for the lower torso; one for the lung; and one for the thyroid. Health Physics Procedure HP-34, Matrix Calibration of the Whole-Body Counter, provides for periodic calibration of the system. A review of the calibration indicates that standardized solutions traceable to the Bureau of Standards are placed in a phantom and nuclide spectra from the calibrated sources are entered into the computer program. The instrument is calibrated using 6 separate radionuclides, those in common abundance in an operating plant, as the comparison library for the data analysis. To preclude missing any library, an alert level of 100 counts in any portion of the spectra is cause for notification of supervision and an additional investigation. All permanent personnel are required to get a whole-body count at least annually. Temporary personnel are required to get a whole-body count prior to any potential internal exposure and at termination from the plant. Whole-body count data is included in form HP-31 and the computer printout is attached and placed in the permanent record of the person, as well as copies provided to the individual. Each whole-body count is reviewed by the HP supervisor and signed before issuance. The above procedure also provides for urinalysis to be used in place of

the whole-body count in the instances where the counter is out of service. Urinalysis samples are sent offsite to a certified laboratory for analysis. Review of records indicated that in some instances this was done and records were in the file for those analyses.

h. The inspectors reviewed the licensee's posting and control of radiation areas, high radiation areas, airborne radioactivity areas, contamination areas, radioactive material areas; and the labeling of radioactive materials in the tours inside the plant. Significant levels of contamination were detected outside of the radiation controlled area and outside of the protected areas by the inspectors and these are discussed separately in section 7 of this report. The inspectors reviewed the radiation controlled area for posting and radiation levels. The Turkey Point facility specifies that the total auxiliary building within the RCA be posted as a radiation area and each high radiation area within the building is posted when the levels exceed 100 mr/hr. The layout of the facility makes this philosphy consistent with 10 CFR 20. All high radiation areas and hot spots were posted with one exception. An unmarked drawer in the chemistry laboratory was noted which contained numerous unmarked reactor coolant sludge samples reading in excess of 200 mR/hr. The samples were not labeled as radioactive materials as required by 10 CFR 20.203 (f) and this was identified to licensee representatives as an item of noncompliance (Infraction 50-250/80-17-18; 50-251/80-15-18). No other discrepancies of the posting requirements were noted within the radiation controlled area.

A survey was conducted of 22 personnel in the radiation controlled area selected at random to determine if they were aware of what dose rates may be expected inside the radiation controlled areas but outside of marked areas. The personnel interviewed covered numerous crafts. Three of those interviewed specifically recognized that dose rates may be from 0-100 mR/hr in the unmarked areas. The other 19 indicated responses such as none, zero, very low, maybe up to 5 or 10 millirem/hour. Discussions with training personnel indicated that they, too, recognized this problem some months ago and had revised their training program to re-emphasize the restrictions and potential dose rates in the radiation controlled areas. They indicated that approximately one third personnel had been through subsequent retraining. The inspectors urged a speed up in the retraining efforts (Inspector Followup Item 50-250/80-17-19; 50-251/80-15-19).

i. Random selection of radiation work permits were reviewed for adequacy of instructions and adequacy of surveys to cover the radiation work procedure requirements. This review indicated that requirements on the RWP's appeared appropriate for the work being performed and that surveys and air samples were available, if indicated, for the RWP's.

Radiation work permits are required for most jobs. The procedure is outlined in Health Physics Procedure HP-1, Radiation Work Permits. Copies of current permits were posted at the entrance to the radiation

controlled area and at the entrances to each of the rooms or facilities for which the RWP's were written. The RWP's frequently stated that surveys were required by HP prior to entry, or notification of HP prior to entry was required, and it was noted that current surveys were posted with the RWP's at those entrances.

The practice as specified on RWP's of requiring personnel to carry a dose rate meter for jobs where dose rates may be above 100mR/hr is supplemented in many instances by health physics coverage, or as in the case of containment work in Unit 4, by Health Physics rovers who routinely survey the various levels of containment and are available for specific work and for general observation and control as necessary. Specific high-level jobs within containment such as the steam generator plugging work were covered separately by specifically-assigned Health Physics personnel.

Observations of personnel entering containment and other areas for radiation work indicated that they were aware of the radiation work permit number and the requirements of the radiation work permit. The radiation work permit system as defined and as practiced appeared to adequately provide radiation protection for personnel and instructions to those personnel.

The routine contamination and radiation survey program for the facility was reviewed. The program requires 38 areas to be smear surveyed and radiation level checked daily. In addition, there are requirements for 34 weekly area surveys, 38 monthly area surveys and 7 quarterly surveys. Records reviewed indicated that surveys were completed, records maintained and that survey activities appeared adequate. Observation of HP personnel conducting daily surveys was also made. Smears are extensively taken and general background levels, radiation levels in the various rooms and areas are checked. It is suggested that HP personnel should consider carrying a more sensitive detection instrument with them on the routine surveys to increase their ability to detect sources not readily visible such as the sources found in the chemical laboratory noted above. (Inspector Followup Item 50-250/80-17-20; 50-251/80-15-20). The routine survey program appears to be complete and adequate with the exceptions mentioned previously.

j. The frequency and location of air sampling appeared generally good. Routine air samples are taken from the auxiliary air ducts. Investigation and action is required if the level of activity shows significant increase over the norm. The majority of air samples are for job-specific activities. During the period March 6 through May 14, a total of 462 air samples were taken. Sampling locations were throughout the radiation control area with a significant number in Unit 4 reactor containment for the specific work going on. As would be expected, sample frequency increased as work load increased. Each air sample is calculated and recorded on a specific form and results reviewed by shift supervision.

k. The licensee's radioactive source check and inventory program was reviewed. Records were in place and indicated that smear surveys had been completed and the inventory was intact. It was noted that the current source check and inventory survey record did not have the signature of the HP tech performing the survey. It was recommended that furture surveys have signatures affixed.

l. Contamination and radiation surveys were made of laundered protective clothing ready for issue. A sampling of 9 single coverall-type protective clothing was surveyed at 6 specific locations. The maximum radiation level detected was 1.5 mR/hr on an elbow using a Xetec instrument. Smears of the garments indicated less than 100 cpm removable contamination.

While observing a routine survey of the clean clothing areas by HP personnel, a significantly high radiation level was detected in the rubber glove storage bin. HP personnel sorted out the gloves and found one with a maximum reading of 21 mR/hr gamma and 475 mrad/hr beta on it. Smears of the glove indicated approximately 26,000 cpm of loose contamination. Observation of a similar licensee routine survey by the inspectors, disclosed another hot glove in the same area. Both of these gloves exceeded the release limits on laundred protective clothing for reissue. However, the laundry was surveyed when it was placed in the bins. The laundry is presently manned by maintenance personnel who are not qualified to survey the protective clothing.

The inspectors recommended the clothing be surveyed by the health physics before it reaches the bins. The procedure for survey of laundred protective clothing was modified to the licensee to prevent a recurrence of the problem (Inspector Followup Item 50-250/80-17-21; 50-251/80-15-21). The supply and availablity of protective clothing for the level of activity being conducted appeared to be adequate.

m. Unit 4 was shut down for steam generator tube plugging work during the period of the appraisal. The dose control system for steam generator jumpers was reviewed. Dose rates in the primary side head of the steam generators range from 10 to 15 rem/hr. Dose controls for personnel entering this area is, of necessity, very critical to control prevent overexposures of personnel. The system for determining exposure available and controlling dose for steam generator jumpers is as follows. Personnel who are assigned as steam generator jumpers spend significant time prior to work performance in a cold mockup away from the radiation area to become familiar with the location and their specific job. Health physics personnel are specifically assigned to control doses to steam generator jumpers. These personnel receive from the individual's supervisor his past absorbed dose and the NRC Form 4 dose history. A separate card and dose record is completed for each individual. Their past exposure record and the daily exposure recieved at Turkey Point facility are checked and entered on a special steam generator record (Form HP-110). Also included on this form is the amount of exposure available for the particular day's work and the estimated dose rates of the particular site he will be going to and the stay time that he is allowed to receive his allotted exposure.

In the work observed by the inspectors, two HP personnel were assigned to the particular job that was to be done. The steam generator jumper, dressed in normal protective clothing required for all reactor containment work, reported to the HP tech at the job site. The HP tech assisted the individual in dressing in an additional waterproof layer of protective clothing. Additional dosimeters, both TLD and high range pencil dosimeters, were taped to the individual's head, then supplied air respiratory protection and hood covering was donned. All protective clothing seams and openings were taped closed by the HP personnel. Immediately prior to the jumper entering the steam generator head, an air sample was taken of the area where he would be. An HP tech using a stopwatch timed the individual from the time he entered the zone until he exited. After the individual left the zone he was assisted in undressing and his pencil dosimeters read by the HP. The steam generator jumper then leaves the zone and all of the information for that entry is collected, entered on record, air sample evaluated and air sample results entered on that data sheet. The information from the data sheet is then retained as a record of that particular individual's entry into the steam generator and pencil readings entered into the computer program. This cycle was completed for each steam jumper entry.

n. In December 1979, a contract worker was overexposed while marking defective steam generator tubes for future plugging (NRC Inspection Report RII 50-250/79-40; 50-251/79-40). An inspector observed the steam generator tube marking and plugging operations and agreed that the commitments made in response to NRC report appear to be adequately followed.

On May 15, an inspector observed mechanical plugging of a unit four steam generator. The operation appeared far more radiologically acceptable than the previous system of explosive plugging. A jumper enters the channel head with a hand held drill, the drill is loaded with a plug, the plug is placed in the tube to be plugged and driven up into the tube where it expands and seals the defective tube. The operation is very fast and no appreciable radioactivity is stirred up. After six separate jumps, exposures averaged approximately 150 millrem per jump in the channel head. A licensee representative stated that the value is close to that which would be expected during explosive plugging. The licensee has commited to mechanically plugging its defective steam generator tubes during the remainder of the outage. The inspector had no further questions or comments regarding tube plugging operations.

n. Some portion of the radiation work in progress at Turkey Point may require exposure to significant beta fields. Discussions with licensee personnel indicated that beta dose rate measurements have been made but that exposure levels were determined primarily by gamma dose rate measurements. Health Physics documentation was reviewed to evaluate if appropriate consideration had been given to beta dose in establishing working dose rates. Documentaion was available that indicated the

Health Physics group had made both dose rate measurements and TLD measurements in steam generator locations to determine the contribution of beta radiation to personnel doses. Comparative measurements have been made with instruments and TLD's covered by protective clothing layers, mask face shield layers and bare to determine the extent of beta exposure. The data indicates that for the energy of beta they experienced in the steam generators the limits for whole-body penetrating gamma radiation will be limiting for all work being done in those locations. Most importantly, the available information in studies that have been made and the knowledge of the individuals responsible showed that the problem of beta dose considerations was recognized, that appropriate consideration had been made for beta dose, and appropriate actions had been selected.

o. Accompanied by licensee's representatives, the inspectors entered the Unit 3 containment while the unit was at 100% power for the purpose of approximating the Nitrogen-16 fields just inside the biological shield wall. Specially prepared TLD's were used for the measurements and a comparison was made with the facilities portable instrumentation. The results of this study indicate that a typical TLD response to a Nitrogen-16 field will underestimate the actual exposure by approximately 20 percent. Therefore, the gamma dose as measured by existing TLD dosimeter systems plus a correction of 20% should be a dose approximation of the true gamma dose, assuming a typical Cesium-137 gamma calibration is used to the TLD dosimeter.

p. The inspectors found the licensees exposure control program to be acceptable, but recommended the following changes: (1) maintain records for Grade D quality air for supplied air systems (paragraph 6.b); (2) establish a records system for Bullard type air filters (paragraph 6.b); (3) obtain air certification records for SCBA's (paragraph 6.c); (4) inspect emergency supplies more thoroughly (paragraph 6.c) (5) increase computer capability for dose control (paragraph 6.d); (6) insure proper wearing of dosimetry (paragraph 6.e); perform performance audits to validate the calibration and performance of TLD systems (paragraph 6.f); (7) acquire a GeLi system for the health physics department (paragraph 6.g); (8) complete general retraining of plant staff for radiation levels (paragraph 6.h); (9) use more sensitive instruments for surveys (paragraph 6.i); and (10) and modify laundry procedures (paragraph 6.l).

7. Surveillance - Outside the Radiation Control Area

a. On May 6, 1980, the inspectors surveyed the area outside the Radiation Control Area (RCA) but within the protected area. In the south-east corner of the RCA, opposite the rad waste building the inspectors noted general area radiation levels of 0.2 to 0.5 mR/hr (1.7 mR/hr maximum) on the ground in front of four temporary construction trailers and approximately six picnic tables. The inspector requested some soil samples to be taken and analyzed by the licensee. Additional surveys by the inspector found some fixed contamination on one of

approximately six picnic tables; no contamination was found inside the four temporary trailers. The licensee's analysis indicated that Cobalt-60 was present in the picnic table and the soil samples indicated the presence of Cerium-144, Cobalt-58, Cobalt-60, Chromium-51, Cesium-137, Manganese-54, Niobium-95, Antimony-125 and Zirconium-9. A quantative assessment was not possible because the licensee had not calibrated the GeLi system for soil samples. It should be noted that a previous inspection (IE Rpt. RII No. 50-250/79-27, 50-251/79-27) had identified contaminated areas outside the RCA in the same general vicinity. Previous inspections also noted the licensee's inability to quantitatively assess soil samples. The area previously (in August 1979) identified had been fenced off. A comparison of the isotopic results from the August 1979 spent fuel pool overflow and the present soil samples indicated that a new problem had arisen.

The licensee posted portions of the protected area as a contaminated area and moved the temporary construction trailers and picnic tables to an uncontaminated location. In addition, several (approximately 20) construction workers were given whole body counts to insure they had no internal contamination. All results of the whole body counts were within expected bounds. Furthermore, each construction worker was independently frisked by health physics personnel prior to exit from the RCA. Only one individual out of approximately 300 had a trace of fixed contamination in his boot.

The licensee continued surveys of the protected area on May 7 and 8. On the late evening of May 8, a small spec was found on the ground in the protected area which read 50,000 counts per minute on an HP-210 probe. Isotopic identification of the spec revealed the same isotopes as the soil samples of May 6. The pattern of samples taken on the seventh and eighth indicated that the area of contamination was heading in a direction beyond the protected area. On the morning of May 9, the inspectors surveyed beyond the protected area fence and found an area approximately 20 to 30 feet wide and 100 yards long which was contaminated above background. The general area was 300 to 500 cpm above background. Hot spots reading from 3000 to 5000 cpm above background were noted. The inspectors also noted that the area was near a sand blasting shop. Sand blasting sand can read in excess of 10,000 cpm. However, isotopic identification identified typical fission and corrosion products in the samples taken. Due to the lay of the land, the contamination stopped some 50 feet before entering the canal system. Samples taken indicated the presence of cobalts and niobium. The inspectors conducted numerous surveys outside the protected area to insure that the contamination was limited to the area identified. Included in these surveys were: the onsite dump, Air Force Survival School, Girl Scout camp, the "Red Barn" picnic facility, outside the Coast Guard facility, boat ramp area, fuel oil storage facilities, construction warehouses, feedwater heater laydown area and the entire plant perimeter. No additional areas of contamination were identified outside the protected area. Licensee's representatives

cordoned off the area outside the protected area and assessed the magnitude of the contamination and the cleanup efforts required.

Meanwhile, other licensee's representatives tried to trace the source of the contamination. The primary suspect was explosive steam generator tube plugging operations which occurred in January 1980. A comparison of the air sample data taken in January 1980, after explosive plugging with the isotopic mixtures found in the soil samples obtained on May 6, 1980, and the isotopic mixtures found in the reactor building ventilation exhaust roughing filters indicated to the inspectors that the explosive plugging operations could have been the source of the problem. Further credence is given to the postulation of the explosive plugging as the source of contamination when the meterological conditions on the days of explosive plugging were examined. During the time of plugging, there existed moderate inversion type conditions with a wind direction blowing to the southeast from the stack, the general area where the contamination was found. The inspectors, accompanied by licensee personnel, surveyed the roofs of the reactor building, auxiliary building, spent fuel pool building, radwaste butler building and the radwaste building. Due to the layout of the buildings relative to the stack, contamination might be expected to be found on the radwaste building and the Unit 4 spend fuel pool building. Slight contamination was found on the radwaste butler building roof.

The inspectors reviewed the plant vent discharge records for January 1980 and found the releases for particulates as measured by the plant vent isokenetic probe to be within Technical Specifications, although elevated over normal releases. The licensee estimated that approximately 8 millicuries of particulate matter was released during the tube plugging operations in January 1980. Estimates of soil contamination indicated approximately two to four millicuries of mixed isotopes to still be on the ground in the backyard. Almost a millicurie of Cobalt-60 was estimated to be present in the backyard. More than one microcurie of Cobalt 60 was present beyond the protected area fence and beyond the surveillance of the licensee. The inspectors observed that, in all likelihood, the explosive steam generator tube plugging operation in January 1980 was the likely source of contamination in the backyard.

When a sample of the reactor building exhaust roughing filter was obtained by the licensee, the inspectors noted the condition of the filters, and later, observed the units in operation. The initial inspection revealed that there was no differential pressure transmitter across the filter bank and the filters appeared dirty and overloaded. Discussions with licensee's representatives revealed that there were no requirements, procedures or uniform system for the change out of the roughing filters. Field observations by the inspectors of the filter bank in operation revealed that the large majority of the filters were separated from their holding frame (because they were overloaded) thereby permitting air to pass unfiltered by them. Ventilation systems problems are discussed further in Section 8 of this report.

Since tube plugging operations for the current outage were immenent, licensee's representatives devoted considerable time and effort to try to avoid a repetition of the past problem. The use of expandable bags to filter the explosive and radioactive off gases from the plugging operation were considered but discarded due to lack of adequate space. The use of mechanical plugging was also considered. The licensee representatives agreed to the use of mechanical plugs. Licensee representatives also stated that the contaminated soil had been removed from the ground outside the protected area and its ultimate disposal was being planned. The inspectors informed licensee representatives that failure to conduct an adequate survey for the period of time January 1980 through May 6, 1980, was contrary to the requirements of 10 CFR 20.201(b) (Infraction 50-250/80-17-22, 50-251/80-15-22).

b. On May 8, 1980, while surveying the area between the RCA and the protected area fence, the inspectors noted that the area around the liquid radwaste discharge lines for units 3 and 4 were reading 0.5 and 3.5 mR/hr respectively. The inspector observed the same radiation levels one hour leter. There was no radiation area posting on either discharge line even though the area is part of the unrestricted area. The inspectors informed licensee representatives that failure to restrict the levels of radiation to less than 2 mR/hr was contrary to the requirements of 10 CFR 20.105.b.1 and was an item of noncompliance (Infraction 50-250/80-17-23; 50-251/80-15-23). Licensee representatives took immediate action to correct the problem.

c. While entering the RCA, the inspectors noted a slight flutter in the response of NRC Region II instrumentation, indicating the presence of radioactivity nearby. The source was found to be emanating from two electrical vaults at the entrance to the RCA. Radiation levels were 0.2 mR/hr at the surface of the vaults to 3 to 4 mR/hr inside the vaults. Additional licensee surveys found an additional six electrical vaults (4 inside the RCA and 2 more outside) with measurable contamination and radiation levels of up to 60 mR/hr in a sump in one of the vaults in the RCA. Subsequently, it was discovered by licensee representatives that the Unit 3 by the containment electrical penetration room had at one time contained approximately 2 feet of contaminated water in the bottom of the room. The inspectors determined that no electrical penetrations had been submerged. However, there were spare conduits in the room which connected the penetration room to the vaults. The penetration room had become contaminated by the failure of the "A" CVCS hold up tank in 1979 and subsequent leakage thru a wall joint. The inspectors also noted that the sumps in the electrical vaults automatically discharge into the storm drain systems. Previously, the inspectors had noticed (IE Rtp. RII: 50-250/79-27; 50-251/79-27) elevated levels of activity in the storm draim system. The inspectors reviewed the licensee's commitments to resolve the problems identified

in the above report and found the commitments were fulfilled. However, the inspectors stated that a more vigorous search for the source of contamination of the storm drain system should have uncovered the contaminated electrical vaults. The inspectors informed licensee representative that failure to survey the electrical vaults to assure compliance with 10 CFR 20.105.b(1) was contrary to the requirements of 10 CFR 20. 201.b and was an item of noncompliance (50-250/80-17-22; 50-251/80-15-22).

d. The inspectors found the licensee's program for surveillance outside the RCA to be inadequate. The inspectors recommended, and licensee's representatives agreed, that procedures should be expanded to include thorough surveys outside the RCA (inspector followup item 50-250/80-17-24; 50-251/80-15-24) and the change out of the containment exhaust filters (Inspector Followup Item 50-280/80-17-25; 50-251/80-15-25).

8. Radioactive Waste Management

a. Process Waste Gas System

An inspector reviewed records of gaseous releases for July 1979 to December 1979 from the licensee's Radioactive Effluent Release Report and gaseous release permits between January and May 1980. All requirements of Technical Specification 3.9.2 appear to have been performed satisfactorily. Calibration records and maintenance request forms for the past 18 months were examined for the gaseous waste processing system. Nuclear Chemistry Procedures C-1 and C-9 were reviewed for calibration of process monitors R-14 (Plant Vent-gross detector) and R-15 (Steam Jet Air Ejector). The calibrations were performed in accordance with Technical Specification, Section 3.9 and Tables 4.1-1 and 4.1-2. No items of noncompliance or deviations were found.

The Steam Jet Air Ejector (R-15) is the primary means of indication of a primary to secondary leak. It is calibrated each time such a leak is confirmed. Air ejector monitor for Unit 3 (R-3-15) was last calibrated 12-22-78. R-4-15 was calibrated March 1980. Weekly samples are taken during a leak, plotted and the data points connected to form a calibration curve. The alarm setpoint is one and a half times background. The inspector had no further questions regarding the Steam Jet Air Ejector Monitor.

The Plant Vent Monitor (R-14) is a G-M tube detector for gross indication of gaseous discharges. It is positioned in the exhaust stack serving both containment buildings as well as the auxiliary building, and the Unit 4 Fuel Handling Building. The NMC monitor is located in the Auxiliary Building. It isokinetically samples the stack effluent for iodines, particulates, and noble gases. The charcoal iodine

sample and the particulate filters are changed weekly. The unit is calibrated based on the gamma spectrum from a Gas Decay Tank sample. Flow rate devices are calibrated by the I&C department. The Plant Vent Monitor (R-14) is calibrated to the NMC. Both were last calibrated July 3, 1979. Each monitor is source checked daily as required by Technical Specification Table 4.1-1. The NMC monitor has no alarm function. R-14 alarms in the control room and automatically terminates any Waste Gas Decay Tank discharge if a high radiation level is reached. Containment purges are not terminated by a high R-14 radiation alarm. The alarm setpoint, one and a half times the expected count rate, is based on the Waste Gas Decay Tank sample gamma spectrum.

In January several releases of radioactive particulate matter were made due to explosive steam generator tube plugging operations (as discussed in Section 7 of this report). The releases were monitored by the containment building monitor as well as the plant vent monitors. No discharge exceeded Technical Specification release limits. The containment building monitor has an automatic isolation function from a high activity signal based on Technical Specification release limits. Review of isotopic discharge records from the NMC plant vent monitor for January showed relatively high releases of Cobalt-58, Cobalt-60, and Cobalt-57.

A licensee representative estimated that a total of eight millicuries of particulate matter was released out of the stack due to explosive plugging operations in January. Although these releases were within Technical Specification release limits, reconcentration of the activity beyond the site protected area boundary has been identified as an item of noncompliance (see Section 7 and Appendix B). The inspectors discussed many methods of containment of particulate matter which becomes airborne following explosive tube plugging. The licensee committed to mechanical tube plugging for the present outage.

NUREG 0578 requires installation of high range effluent monitors on all gaseous discharge pathways. The inspector was informed that work has been progressing toward meeting this requirement. Monitors should be available for installation by January 1, 1981. A licensee representative also stated that an engineering request has been submitted to reroute the air ejector discharge to the plant vent. This will eliminate the requirement to supply a high range effluent monitoring device for each steam jet air ejector.

The inspector reviewed results of the leak testing program for primary systems components outside the containment building as required by NUREG 0578. Operating Procedure 0206.4 was written to ensure compliance.

The data showed numerous small leaks, mainly from valves, which were corrected. In addition, the inspector reviewed maintenance requests on the Waste Gas Compressors and noticed extensive work had been performed to eliminate leaks. The inspector had no further questions regarding the Waste Gas Decay Systems or the requirements of NUREG 0578.

b. Filtration System

An inspector reviewed performance test procedures for the following filter systems:

(1) Emergency Containment Filter System
(2) Post Accident Containment Ventilation System
(3) Control Room Ventilation System

It was noted that although not required by Technical Specification 4.7, these procedures call for testing in accordance with ANSI N510-1975 if the systems had been maintained. The inspector had no further questions concerning filter system procedures.

The inspector reviewed results of testing of the Unit 4 Containment Building Emergency Filtration System on May 12, 1980. Representative charcoal samples from both filter trains A and C were given an elemental iodine test in accordance with ANSI N510-1975 and procedure 4704.3. Filter train A tested to 99.95% efficiency and Filter Train C tested to 99.95%. The inspector recommended that the filters be given an methyl iodide test in place of the elemental iodine test because the former will give a better indication of filter efficiency. A licensee representative stated that their emergency filter system is a recycle system and that the more accurate methyl iodide test was appropriate only for once through effluent filter systems. The inspector reminded the licensee that Regulatory Guide 1.52 calls for the methyl iodide testing. The licensee's action on this matter will be evaluated during a future inspection. (Inspector Followup Item 50-250/80-17-26; 50-251/80-15-26).

The inspector reviewed results of filter inspections performed last January on the Unit 3 filtration systems. Twenty four HEPA filters were replaced in the Emergency Containment Filtration System due to small pin holes. The licensee felt that these resulted from fine matter penetrating the filter during certain outage operations.

The emergency filter banks are now covered with a protective sheath during outages. The HEPA filter of the Post Accident Containment Vent System was also replaced. It was damaged due to the removal of the charcoal filter which is used as a sample and changed each refueling. The inspector had no further comments or questions regarding filtration systems.

On May 13, two inspectors examined air flow patterns throughout the Auxiliary Building and Radwaste Building with a hot wire anemometer and smoke tubes. The air flow direction in the main corridor of the Auxiliary Building was dependent upon the open/closed status of its doors. Numerous cubicles had air flowing in on the bottom of the doorway and out from the top or vice versa. Air movement in most of the cubicles was less than 100 feet per second. In several instances, air was found to flow from a more contaminated area to one of less contamination. They were: (1) the decontamination room into the tool room, (2) the Unit 3 RHR pit into the Auxiliary Building main corridor, and (3) respirator mask decontamination room into the Radwaste Building. The licensee agreed to evaluate the problems with the ventilation system (Inspector Followup Item 50-250/80-17-27; 50-251/80-15-27).

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

(1) evaluation of need to upgrade filter systems for the Containment Building (discussed in Paragraph 7.a) and to incorporate the use of a methyl iodide efficiency test in charcoal sample testing (Paragraph 8.b).

(2) complete evaluation of ventilation systems in the Auxiliary and Radwaste Building (Paragraph 8.b).

c. Liquid Waste

Radioactive liquid waste is processed by a portable demineralization system purchased in January 1980 from Hittman Nuclear Development Corporation. Between January 1978 and January 1980, a portable demineralization system from Chem-Nuclear had been used in conjunction with the plant's waste evaporator to process liquid radwaste. The present system is operated by an onsite Hittman representative and consists of two 170 cubic foot demineralizers in series, three diaphragm pumps, and associated piping and instrumentation. It is capable of processing 100 percent of the radioactive liquid presently generated. There are sufficient interlocks between level indicators, pressure sensors, pumps, and valves to ensure no inadvertent spill of radioactive water and/or resin will occur due to equipment failure or overfill. The piping is all flexible hose and connects to the Waste Holdup discharge. Permanent hard piping should be considered by the licensee to improve the system. (Inspector Followup Item 50-250/80-17-28; 50-251/80-15-28).

The volume of water to be processed has decreased markedly with the rerouting of radioactive laboratory drains away from the laundry waste tank. Prior to this system modification the liquid waste processing system handled an estimated 10 to 11 gpm continuous inflow to the holdup tank. Since the installed 2 gpm Waste Evaporator was inadequate to treat this quantity of water, two actions were initiated: (1) an outside contractor installed a portable demineralization processing system, and (2) the conversion of a 20 gpm Boric Acid Evaporator to a

waste evaporator. In the fall of 1979, the elimination of substantial radioactivity in the laundry system by rerouting laboratory drains as mentioned above, permitted laundry waste to be sampled and discharged within technical specification limits, thereby reducing the quantity of liquid radwaste to the Waste Holdup Tank to an estimated 1 to 2 gpm.

Although the waste evaporator has sufficient capacity to process 1 to 2 gpm, the licensee decided to continue operation of the portable demineralization system. At the present time, the waste evaporator and the converted boric acid evaporator are idle with no expectation of restoration to service in the near future. Health Physics personnel have stated that exposures have declined with the use of the portable demineralization system as well as a reduction is solid waste handling.

The inspector reviewed Hittman Nuclear Development Corporation Procedure F-419-P-001 Rev. 1 for the operation of the portable demineralization system and Operating Procedure 5333.4 for waste solidification. The procedures appear to adequately address the operation of the systems. From discussions with a licensee representative and observations of the operation of the Hittman demineralization system, the inspector concluded that good radiological controls and practices are being followed.

When spent demineralizers are removed from operation, they are stored in a controlled, shielded area in preparation for shipment to the burial iste. When asked how he ensures less than one percent free standing liquid remains in the liner before shipping, a licensee representative stated that the liner sits for a certain amount of time at an incline to achieve gravatational concentration of excess liquid at a point where a suction pump is attached and removes the liquid from the liner. The inspector observed a spent demineralizer inclined in preparation for dewatering, the operation of the suction pump used to dewater the resin bed, and concluded that the licensee's actions are adequate to meet all burial site criteria. The inspector informed the licensee that a written procedure describing the dewatering operation in detail should be prepared as soon as possible. (Inspector Follow-up Item 50-250/80-17-29; 50-251/80-15-29).

The inspector reviewed liquid release records for calendar year 1979 and the first 4 1/2 months of 1980. All values appear to be representative of releases expected from equivalent facilities and are less than technical specification limits, except for the quantity of Sr-90 which appeared to have been released from the Waste Disposal System in July 1979. Radiological Effluent Release report dated February 22, 1980, lists 1.16 millicuries of Sr-90 discharged in July 1979 while the highest value for the remainder of the year was a factor 20 less. The inspector was informed by licensee representatives that the chemical analysis was incorrect due to a contaminated sample. A review of the analytical results of the sample showed gross contamination with Co-58, Co-60, and Mn-54. The counts from the contamination were attributed to Sr-90 before the error was discovered. The licensee has initiated a new review process of strontium analysis to preclude the recurrence of the problem. The technical specifications require a

quarterly strontium analysis. The licensee performs a monthly analysis on the composite liquid waste sample. The inspector had no further questions regarding liquid release records.

Following the overflow of the Unit 4 Spent Fuel Pit and resultant ground contamination from the yard drain system pathway (see Report RII 50-250/79-27; 50-251/79-27), the licensee committed to periodic sampling of the storm drain system. Normal storm drain sampling occurs the first week of each month. Since this program was instituted, two instances of radioactive releases through the storm drains have been recorded. Normal sampling picked up radioactivity traced back to the overflow of the Condensate Recovery Tank (CRT). The activity in the CRT was attributed to the leaks in a Boric Acid Evaporator. The tubes have since been plugged.

Sampling also picked up radioactivity attributed to resin which overflowed onto the roof of the Auxiliary Building. The roof drains were thought to be connected to the Waste Holdup Tank. However, as originally designed, the roof drains are connected to the storm drains. The contaminated material was drummed and removed as solid waste. The roof was coated with a sealant to fix any remaining contamination.

During the week of this appraisal team inspection, an inspector discovered contamination in electrical vaults outside the radiation control area. Readings up to 60 millirem per hour from water in the bottom of the vaults were discovered as described in paragraph 7.c of this report. From the storm drain samples taken, activity was found in the portions of the system connected to the electrical vaults but the levels were considered too low to require investigation. The activity was recorded and accounted for in all liquid release reports. The inspectors concluded that the activity was probably discharged to the storm drain system only after excessive rain and that it is likely some was discharged and not monitored due to the relatively infrequent sampling by the licensee. This is another example of an item of noncompliance for failure to perform an adequate survey outside the radioactive control area (Infraction 50-250/80-17-22; 50-251/80-15-22). It appears that the storm drain sampling program has been beneficial in discovering previously unexpected radioactivity release pathways. However, the licensee should consider: (1) more frequent or additional sampling following periods of excessive rain, and (2) establishing an investigation threshold on sample results to determine the source of each release.

An inspector examined calibration records and maintenance requests for the last year and a half on liquid effluent monitors R-18 (Liquid Effluent Control Monitor) and R-19 (Steam Generator Blowdown Monitor). The requirements of Technical Specification 3.9.1(g) appear to have been satisfied for both monitors. The Steam Generator Blowdown Monitor is calibrated yearly during outages. The inspector had no questions or comments concerning maintenance requests.

Calibration curves for R-18 are generated yearly by analyzing a sample of a waste tank, usually the Waste Condensate Tank, diluting the sample to obtain a second data point, and plotting the results. The alarm setpoint for monitor R-18 is based on the background count rate and the expected count rate of the release obtained from the discharge sample analysis and the corresponding value from the calibration curve. The monitor is backflushed after each release to control the background count rate. The background has been relatively consistent between 8,000 and 22,000 counts per minute.

The Discharge Permit requires a functional check of the capability of R-18 to automatically close the waste discharge valve as required in Technical Specification 3.9.1(e). An inspector reviewed liquid waste discharge permits LR-80-294 and LR-80-295 on May 14 and verified that this check had been done and is being done routinely. The inspector noticed that both permits were for the "B" Waste Monitor Tank and was told that LR-80-295 had been written because LR-80-295 had terminated due to an apparent high activity alarm from R-18 and subsequent discharge valve closure. The inspector reviewed the strip chart recording of the release and confirmed that liquid discharge was terminated at 1030 on May 4, 1980. Through discussions with licensee representatives and review of applicable data, the inspector verified that the "B" Waste Monitor Tank was recirculated and sampled prior to issuance of waste discharge permit LR-80-295. Analysis of the sample did not indicate any discrepancies from the initial sample taken for discharge permit LR-80-294. The inspector concluded that no unexpected amount of radioactivity was released.

The inspector accompanied by a licensee representative observed the closure time of the liquid discharge valve. Based on size of piping, normal discharge flowrate, and valve closure time, the inspector determined that the cause of an R-18 high activity trip would not be contained within the system for subsequent recycling and sampling. The inspector verified that the location of the valve and the speed with which the discharge valve closes mitigates the radioactive release as committed to in the FSAR and Technical Specification. However, the licensee should consider moving the discharge valve or replacing the valve with one that closes more quickly in order to ensure no activity resulting in a high alarm signal to monitor R-18 is discharged.

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 of the program as stated above in this paragraph:

(1) a periodic review of the system as a complete entity to identify methods for waste processing reductions;

(2) permanent piping for the portable demineralization system;

(3) establishment of a dewatering procedure;

(4) changes to the storm drain sampling program incorporating:

(a) more frequent or additional sampling following heavy rains; and

(b) establishment of an investigation threshold to determine sources of high activity in samples.

(5) modifying discharge piping and valve arrangement to ensure total containment of activity causing an R-18 trip;

(6) modify review process of strontium analysis results for timely recognition of discrepancies.

d. Solid Waste

An inspector reviewed the licensee's records of solid waste generated in 1978 and 1979 and the estimates for 1980. The Turkey Point Plant had a volume reduction of 46.5 percent in solid waste generation and offsite shipments between 1978 and 1979. The activity contained in these solid wastes showed a reduction of nearly 70 percent over the same period.

The major contributors in the reduction were a reduced volume of non-compressable waste and a reduction in the amount of solidified waste. Initial figures indicate further reductions can be anticipated for this calendar year due to the operation of two new process systems. A new trash compaction system will combine non-compressible with compressible wastes and reduce overall dry radwaste onsite. A new portable demineralization system will essentially eliminate solidified wastes due to it's full liquid waste processing capability. The latter will reduce the use of waste evaporators and subsequent solidification of evaporator bottoms. A slight increase can be expected in the volume of compacted waste and radioactive spent resins generated with the use of the new process systems. However, the increase should be limited so that an overall reduction in yearly solid waste generation is realized.

Additional attempts at waste reduction include: (1) positioning a health physics technician at the entrance to the containment building equipment hatch to limit the influx of material which will have to be handled as contaminated waste; (2) additional training of workers in the need for radioactive waste reduction; (3) color coding trash bags to separate radioactive trash from non-radioactive trash; and (4) rerouting contaminated laboratory drains away from the relatively clean laundry waste tank which has reduced the amount of radioactive water to be processed by the portable demineralization system by at least 75 percent. This will reduce the volume of spent resins considerably in 1980.

The inspector was informed by licensee representatives that work is scheduled to begin in 1980 on a radwaste storage facility in the southeast corner of the radiation control area. The building will have a storage capacity of approximately two years worth of dry radioactive waste generation. The amount of dry waste persently being stored onsite is approximately two thousand cubic feet. At the end of 1979, three to four times that amount was stored onsite which taxed the plant's present capability to store waste. The new storage facility should be sufficient for future storage requirements.

Following problems associated with LSA Shipment 80-001 (see NRC inspection report, RII 50-250/80-11; 50-251/80-11), the licensee purchased a new waste compaction system from CGR Compacting, Inc. The system compacts non-compressible as well as compressible trash in a 95 cubic foot steel reinforced wooden box under greater pressure than the old system which used standard 55-gallon drums. The result is more tightly compacted waste. Preliminary licensee experimental data indicates approximately four to one volume reduction over waste compacted by the earlier system. The inspector was informed that similar units at Fitzpatrick and Con Yankee have experienced five to one reductions on compactable items. The fact that the wastes are more tightly compacted offers the added advantage of ensuring no shifting of cargo during transport to burial sites, as appeared to be the case with LSA Shipment 80-001.

Based on observed system operation, an inspector estimated that external exposures due to waste compacting and truck loading should decrease by a factor of two with the continued use of the CGR compactor. However, there appears to be a potential for internal exposures if the compacting operation is not performed within certain restrictions. Although the compactor unit is equipped with a ventilation system to filter potentially contaminated air exhausted from the waste as it is compacted, personnel loading the compactor stand aside and puncture the waste bags. The inspector reviewed results of grab air samples taken periodically in the worker's breathing zone. He determined that the licensee was in compliance with the regulations. However, it was suggested that a continuous air sample should be considered so that potentially radioactive puffs from each bag being opened will be monitored. The licensee will study the situation and resolve any discrepancies. An inspector will review the licensee's corrective actions during a future inspection (Inspector Follow-up Item 50-250/80-17-30; 50-251/80-15-30).

An inspector questioned licensee representatives, and the CGR representatives contracted to operate the compaction system as to how they ensure the compacted waste contains no free-standing liquid. The inspector was informed that personnel loading the compactor inspect each sealed bag for items which may contain liquids. These bags are set aside and not compacted. Licensee representatives stated that a modification of the steel lined box to include a drain is being studied. The inspector observed the inspection for items containing liquids and had no further question or comments concerning waste compaction.

The inspector reviewed the licensee's concrete solidification program and was informed that very little if any solidification is expected in the near future. Sludges from bottoms of tanks are solidified periodically; however, evaporator bottoms present the major source of radioactive waste to be solidified. The volume of solidified wastes is dependent upon the amount of liquid radwaste processed. Reduced solidification is expected because of the full process capability of the portable demineralization system due to the decrease in radwaste water (see Liquid Waste section). In 1978, 1,395,634 gallons of water were processed by Chem-Nuclear' portable demineralization system. In addition, 300,000 pounds of cement was used (at 8 1/2 pounds of cement per gallon of water) to solidify evaporator bottoms. In 1979, the totals were 2,362,731 gallons and 80,630 pounds respectively. Since the waste evaporators are not expected to be used this year, the volume of solidified wastes for 1980 should approach zero.

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 of the program:

(1) continuous breathing zone air sample for personnel perforating waste bags if perforation is deemed necessary;

(2) installation of drain on CGR compactor boxes.

e. Radioactive Waste Shipping

An inspector examined the licensee's radioactive waste transportation program for compliance with NRC, DOT, and State of South Carolina shipping and burial regulations. Health Physics Procedure HP-46 appears to satisfy the applicable requirements for receiving and shipping radioactive wastes.

Specific requirements of the Barnwell Waste Disposal Site Criteria and the Chem-Nuclear burial license have been incorporated into shipment release form. Separate release forms for specification containers, LSA boxes, and storage drums containing radioactive wastes are available. These forms serve as a check off sheet for requirements necessary prior to approval for shipment offsite. Extensive interface between Quality Control and Health Physics is evident as required by IE Bulletin 79-19. Discussions with Quality Control and members of the health physics department indicate that the requirements of the Certificates of Compliance (C.O.C.) for individual shipping casks have been satisfied for each shipment. The inspector suggested that documentation of the fulfillment of C.O.C. requirements should have greater emphasis on the release approval form.

On May 14, the inspector observed the licensee's operations for shipping a radioactive 170 cubic foot spent resin liner to the Barnwell Waste Disposal Site (Shipment number 80-032). Specification Container Release Form HP-72/C was used. The licensee and the inspector performed independent radiation surveys on the arriving truck and shipping cask.

The QC receipt inspection revealed a head gasket missing. A spare gasket was installed by the onsite cask manufacturer representative prior to loading the spent resin liner. Although favorably impressed with the overall interaction between the different groups required to prepare the radioactive shipment, the inspector could not discern who had overall responsibility for conduct of work. The manufacturer's cask handling procedure is kept by Health Physic personnel who do not officially direct the maintenance personnel handling the cask. The inspector stated that responsibility should be delineated to control all activities surrounding waste handling and shipment. The inspector acknowledged the formation within the Health Physics group of a Radwaste Section to concentrate on shipping of radwaste and had no further questions regarding waste handling.

The inspector reviewed records for shipments 80-001 through 80-032 and discussed preparation of shipping papers with licensee representatives. Activity is determined from dose rate readings at a certain distance from the container using tables supplied by a consultant. The inspector reviewed the consultant's calculations and noticed that the values for compacted trash and spent resin liners refer to waste containers no longer in use. The present trash compaction system compacts non-compressible as well as compressible trash in a 95 cubic foot steel lined wooden box under greater pressure than the old system which used standard 55-gallon (7.5 cubic feet) galvanized steel drums. The result is more dense compacted waste. The consultant's data for resin lines include values for Chem-Nuclear's 80, 195 and 300 cubic foot liners while the present portable demineralization system utilizes a Hittman 170 cubic foot liner. The inspector expressed concern for the adequacy of the activity estimation using data generated for the obsolete systems. The licensee stated that they will study and resolve any apparent discrepancies. (Inspector Follow-up Item 50-250/80-17-31; 50-251/80-15-31).

The licensee's method of weight estimation was also questioned. An estimate is made using an assumed density and the known volume of each type container. The inspector acknowledged the licensee's comment that a load cell is on priority order. It was pointed out that the weight of each shipment is a prerequisite to the determination of LSA applicability. Since the levels of activity in all LSA shipments reviewed by the inspector were extremely low and the weights recorded on the shipping papers appeared to be reflective of expected weights of such shipments, the inspector had no further questions.

The inspector was informed by licensee's representatives that the isotopic abundance is determined by a GeLi analysis, on a direct sample of the waste in the case of spent resin shipments or a compilation of room smear survey results for shipments of compacted trash and waste sludges. The inspector stated that some methodical sampling of trash and sludges would be more accurate in isotopic abundance

determination. A review of waste shipments for calendar year 1980 revealed that no Group I or II isotopes are listed on the shipping forms. Licensee representatives stated that previous calculations of primary coolant activities for Group I and II isotopes disclosed that these isotopes would result in estimated values less than 10 percent of LSA limits. The inspector stated that a better estimate of Group I and II isotopes could be made as these isotopes are expected to concentrate in resin beds, evaporator bottoms, and possibly trash. Furthermore, the only exemption to listing Group I and II isotopes on the shipping record is that found in 10 CFR 71.7(a), which exempts the licensee from all requirements for packaging and transporting radioactive waste, including isotope identification, if each package contains less than 0.002 microcuries/gram of licensed material. The determination of Group I and II isotopes in radwaste shipments will be examined during subsequent inspections (Inspector Follow-up Item 50-250/80-17-32; 50-251/80-15-32). The inspector had no further questions or comments on shipping records.

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 of the program as described in the above paragraphs:

(1) place greater emphasis on the shipment release approval forms on the requirements of the Certificates of Compliance;

(2) delineation of responsibility for radwaste shipping and handling crews;

(3) determination of applicability of existing tables of activity determination from dose rate readings at certain distances from a waste container to present waste shipping containers;

(4) acquisition of load cell for shipment weight determination;

(5) more accurate determination of quantity of Group I and II isotopes in radwaste shipments and inclusion of same in shipping records when appropriate.

9. ALARA Program

a. The recommended bases for an ALARA program are contained in Regulatory Guides 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will be as Low as is Reasonably Achievable (ALARA)", and 8.10, originally dated April 1974, "Operating Philosophy for Maintaining Occupational Radiation Exposures as Low as is Reasonably Achievable". In addition, 10 CFR 20.1.c, recommends that "...persons engaged in activities under licenses issued by NRC... should make every reasonable effort to maintain radiation exposures... as low as is reasonably achievable." From discussions with licensee's representatives and observation of actual work practices the inspectors found that many elements of an ALARA program did exist at the facility.

However, licensee representatives stated that maintenance and operations procedures do not routinely receive health physics review prior to issuance. The inspector commented that all procedures involving work on radioactivity contaminated systems, handling of radioactive material or work in radiation areas should be reviewed by the radiation protection staff as far in advance of the work as possible. This review is necessary to insure that adequate consideration is given to health physics and engineering aspects of the work, including staffing, availability of health physics equipment and supplies, temporary shielding, engineering controls to minimize airborne radioactivity and to keep exposures ALARA. In the professional judgement and observations of the inspectors, the ALARA program practiced means no one receiving radiation exposures in excess of the administration limits. A formal ALARA program with a specialist assigned primary responsibility for ALARA and with technical engineering support did not exist and the inspectors recommended that one be established (Inspector Followup Item (50-250/80-17-02; 50-251/80-15-02). The inspector noted that a radiological engineering support (or ALARA) group could have helped avoid the problems discussed in Section 7 of this report The inspectors also noted that the plant staff did reorganize temporarily into an ALARA type group just to handle the problems found.

b. Cognizant of the efforts presently being undertaken at the corporate level, the inspectors found the ALARA program acceptable but urged licensee representatives to consider the recommendations in the Regulatory Guides and implementation of a formal ALARA program at the facility. Licensee management agreed to look into the matter. The inspectors also mentioned to licensee representatives that one of the basic elements of an ALARA program is the capability of collecting and sorting historical radiation exposure data in order: (1) to evaluate the status of any on-going job, and (2) to plan in the future for further reductions in exposures. The inspectors found many functional elements of various computer codes which could accomplish these tasks. However, the type of computing equipment presently available does not permit an efficient utilization of the data available. The inspectors recommended that management consider providing an expanded computing capability to the health physics department such that the goals of an ALARA program can be accomplish (Inspector Follow-up Item 50-250/80-17-14; 50-251/80-15-14).

10. Facilities and Equipment

a. Records indicate that the plant instrument supply is approximately 165 instruments. These range from air sample counting instruments, frisker units for surveying, dose rate instruments, teletectors and high range emergency instruments. A large number of dose rate instruments are required because of the plant requirement that personnel entering high dose rate areas without Health Physics coverage must carry a dose rate instrument with them. Dose rate instruments are wrapped in plastic to reduce contamination and signed out to personnel at the entry to these work areas and instruments are assigned to individuals by number and individual name. Instruments are checked back in when the individual leaves the area or the instrument is no longer needed.

During heavy work periods it was noted that a large number of survey instruments had been signed out, per plant requirements leaving, essentially no dose rate instrumentation for the Health Physics personnel to use. It is recommended that additional supplies of dose rate instrumentation be provided to cover these high frequency use periods. (Inspector Follow-up Item 50-250/80-17-33; 50-251/80-15-33). Supply of instrumentation used for personnel surveying (friskers) appeared to be adequate. Numerous locations had friskers installed in a permanent position for personnel surveying and additional friskers were noted in the calibration shop going through the calibration process.

b. Discussions were held with plant I&C personnel to determine the extent and types of health physics instrument repair. It was stated that no special repair records are maintained on the health physics instrumentation and that the work order is only recorded for total manhours used. Computer data for the period May 1979 to April 1980 indicated that 440 work orders had been utilized for HP instrument repair and a total of 181 manhours used for those repairs. Based upon memory, the I&C personnel indicated that the primary repair problems with HP instrumentation was cable failure due to cable damage. While no other specific records were kept, the extent of repair indicated by the computer program does not seem excessive for the number of instruments in service.

c. The instrument calibration program at the Turkey Point facility is in the process of change. Previously, all instruments were sent offsite to a certified laboratory for calibration. The new system, in the process of being established, is for onsite calibration of all instruments except the PNR 4's, neutron dose rate instruments. These will still be sent offsite because a neutron source is not available onsite. Past records of offsite calibration were on file and maintained.

The new system of in-house calibration utilizes a multiple source gamma calibrator. A separate building has been set up for use as a calibration laboratory and mask repair station. The Health Physics management has assigned a specific individual responsibility for establishing a calibration program and maintaining the records for the calibration of in-plant equipment. A calibration records system is being set up to maintain individual records on each instrument and provide date of calibration and date due for recalibration. Calibration stickers are also placed on each instrument. Licensee personnel were requested to check the calibration on an instrument brought to the site by the inspectors. The calibration point was established on each of the 4 ranges of the instrument provided. All calibration points were in very close calibration except the high point of the high range (the 5R/hr range). The calibration point indicated 4.56 R/hr. The offsite instrument read 3.75 and 3.9 in two different attempts. The calculated reading was approximately 15% high at that point. All other readings were within 3% of the instrument. The instrument used was checked prior to site visit and after the site visit and was within 5%. While this error causes instruments to be calibrated in

the conservative direction, it is recommended that licensee reverify the high calibration point. (Inspector Follow-up Item 50-250/80-17-34; 50-251/80-15-34).

The calibration of air flow on air sampling devices was reviewed. Air sample flow rates are calibrated using a Venturi calibrated offsite and a flow meter calibrated by the I&C department. The flow rate calibration is unique in that the parameters specified on the instruments are time rather than actual flow rate. The sampling program requests and uses a set volume for its calculations, consequently flow rate is set to establish that volume in a preset time. No records are kept of the air sample flow rate calibration. Stickers are placed on each air sampling device with a due date. It was recommended to licensee personnel that a record system be established and maintained. (Inspector Followup Item 50-250/80-17-35; 50-251/80-15-35).

d. Eberline RM-14 and RM-15 units are used extensively with the HP-210 probe for area and personnel surveying. Calibration of these units is primarily an electronic calibration using a pulse generator to establish meter response to an input signal. The HP-210 probes are source-response checked to a specific source and must fall within a designated range of efficiency to be acceptable for use. No direct source calibration is made for the detector readout combination. However, a functional check is defined prior to each use to assure that the functional response falls within a specified range. Records of electronic calibration and HP-210 probe efficency calibration are maintained.

While no procedural requirements were found to define frisker alarm trip settings, conversations with licensee personnel indicated a trip setting of frisker alarms should be 100 cpm above background. Using a Technetium-99 source of approximately 21,000 cpm, 9 friskers at checkout stations were checked to determine their response and their alarm settings. Three alarmed at approximately 100 cpm above background, 3 alarmed only at full scale and 3 alarmed at approximately 90% of full scale. It was noted in observing personnel frisking upon leaving zones, that a large number rely upon alarming of the frisker rather than visual observation of the meter. HP Procedure HP-70, Decontamination of Personnel, in section 8.1.1, indicates that if the meter reading indicates greater than 100 cpm above background, the person will be considered contaminated. To meet this requirement the alarm levels should be at or below 100 cpm above background. It is recommended that additional emphasis be placed on maintaining and assuring that frisker alarm trip settings are at or below that release level. (Inspector Follow-up Item 50-250/80-17-36; 50-80-15-36).

At two locations, the Health Physics office, and the radwaste trailer, a shielded frisker probe is located at foot level for survey of feet prior to entering these and drinking areas. To provide protection from dirt these instruments have been covered with plastic. A check with a Technetium 99 source indicates that sensitivity of these probes

has been reduced 25 percent or greater because of this. The alarm settings on these two particular instruments were set at full scale. Observations of personnel entering these areas indicated that foot surveys are taken; however, frequently, the meters are not observed and the foot survey is somewhat automatic. The alarm settings should be at the release limits for effective use of these instruments with consideration given to lower sensitivity because of the plastic cover.

e. The inspectors observed that portable Health Physics instruments were being checked prior to use by holding the instrument near a radiation source and observing that the instrument responded to the radiation. Health Physics Procedure HP-13, Portable Survey Instruments, specifies that this will be done. This check, however, does not insure that the instrument will function properly. The response is checked on only one scale and a radiation response does not necessarily mean the instrument is functioning properly. It is recommended that ANSI N323-1978, section 4.6, be reviewed and a functional check system be implemented. This procedure requires that the instrument be exposed to a check source immediately following calibration in a constant and reproducible manner. Reference readings should be obtained on each scale normally used. If the instrument response to the check source on subsequent response checks differs from the reference reading by more than 20 percent the instrument should be removed from service and recalibrated(Inspector Follow-up Item 50-250/80-17-37; 50-251/80-15-37). This type of operability check is stated in Health physics Procedure HP-16, Count Rate Instrument Calibration, in section 8.5.5. However, this functional check is not performed in the field and this requirement does not cover dose rate instrumentation.

f. The inspectors reviewed the radiation monitoring instrumentation availability in the control room. The system is composed of 24 units, 3 units in containment of Unit 3; 3 units in containment of Unit 4; and the remainder in the auxiliary building, spent fuel storage areas and the control room. Calibration records were reviewed for 1979 and 1980. Records and calibration were current and maintained and set points identified at the instrumentation. Meterology instrumentation giving wind speed and direction are readily available and visible to the operator console in the control room. This data is recorded on charts and by operators twice per day on routine data sheets.

g. The analytical capabilities of the plants Geli systems were not evaluated by the appraisal team. They were recently evaluated by a separate team and the findings are discussed in report RII 50-250/80-08; 50-251/80-8.

In summary, the appraisal found the instrumentation at the Turkey Point facility to be adequate although improvements were recommended in calibration and functional checks of instrumentation prior to use (Paragraph 10.e), quantity of equipment available (paragraph 10.a), reverification of calibrator (Paragraph 10.c), and setting of frisker alarms (paragraph 10.d).

11. Procedure Review

a. The following procedures were reviewed by the inspectors:

HP1	Radiation Work Permit
HP2	Radiation Rules of Practice
HP3	Health Physics Instructions to the Guard Force
HP10	Calibration and Operation of Health Physics Laboratory Counting Equipment
HP11	Operation of Portal Monitors and Hand and Foot Monitors
HP13	Portable Survey Instruments
HP16	Count Rate Instrument Calibration
HP22	Airborne Contamination Surveys
HP31	Personnel Monitoring of Internal Dose-Bioassays
HP33	Operation of Whole-Body Counter
HP34	Matrix Calibration of the Whole-Body Counter
HP53	Iodine-131 Air Activity Determination by Use of Whole-Body Counter
HP60	Respiratory Protection Manual
HP61	Full Face Respirator, Air Purifying Type, Scott, Series 6031 and 6033
HP62	Full Face Respirator, Air Purifying Type, Mine Safety Appliance Model 84304
HP63	Full Face Respirator, Self Contained Breathing Apparatus Type, Mine Safety Appliance Model 401
HP64	Full Face Respirators, Airline Type, Scott and Zephair
HP65	Maintenance, Accountability, Cleaning, Inspection, and Storage of Respiratory Protection Equipment
HP66	Selection, Use, Issue Control and MPC Hour Accountability of Respiratory Protection Equipment
HP67	Full Face Respirator, Self Contained Breathing Apparatus Type Scott Pressure-Pak II
HP68	Operation of the Sodium Chloride Respirator Test Booth
HP70	Decontamination of Personnel
HP90	Inventory of Emergency Equipment
HP91	Emergency Radiation Team Response
HP101	Radiological Incident Reports

The inspectors recommended the following changes be made to strengthen the procedures (Inspector Follow-up Item 50-250/80-17-38; 50-251/80-15-38):

HP-13, Portable Survey Instruments - The procedure should be revised to include the range of acceptable response when functionally checked on a check source before each use as outlined N323-1978 entitled, "Radiation Protection Instrument Test and Calibration", section 4.6. The procedure should also include specification of the appropriate alarm setpoints for survey instruments used at frisker locations.

HP-60, Respiratory Protection Manual, Section 12.2.4 - Procedures should be revised to include specific requirements for assuring grade D quality air as described in NUREG-0041.

HP-62, Full Face Respirators, Air Purifying Type, Section 4.2 Specifies an assigned protection factor of 100 for this air purifying respirator. This in conflict with HP-60, Respiratory Protection Manual, and should be revised to read 50.

HP-63, Full Face Respirator, Self-Contained Breathing Apparatus Type, Section 4.2 - Specifies a protection factor of 100 for SCBA units. This is also in conflict with statements in HP-60, Respiratory Protection Manual. It should be revised to read 10,000.

HP-65, Maintenance, Accountability, Cleaning, Inspection, Repair and Storage of Respiratory Protection Equipment, Section 4.3 - Also specifies the use of Grade D quality air. Either this procedure or HP-60 above should provide specifics and methods and sampling frequencies for assuring Grade D quality air.

b. Health Physics Manual dated April 18, 1977, Rev. 1 - The manual is well written, reasonably current and covers all the elements of a good health physics program; however, the inspectors noted some areas where the manual could be strengthened. Specifically:

(1) The manual includes the licensee's definition of ALARA and provides general guidelines of ALARA philosophy throughout the document. Specific instructions for implementation of ALARA are provided primarily as recommendations and documentation is not required.

(2) Documentation to "demonstrate the improvements have been sought, that modifications have been considered, and that they have been implemented where practical" (Reg. Guide 8.8) is not required by the manual and not generally available at the plant.

It was the opinion of the inspectors that a dedicated ALARA group should be formed and responsibilities outlined for implementation and do documentation of an ALARA program.

Fig. 1 PLANT ORGANIZATION CHART

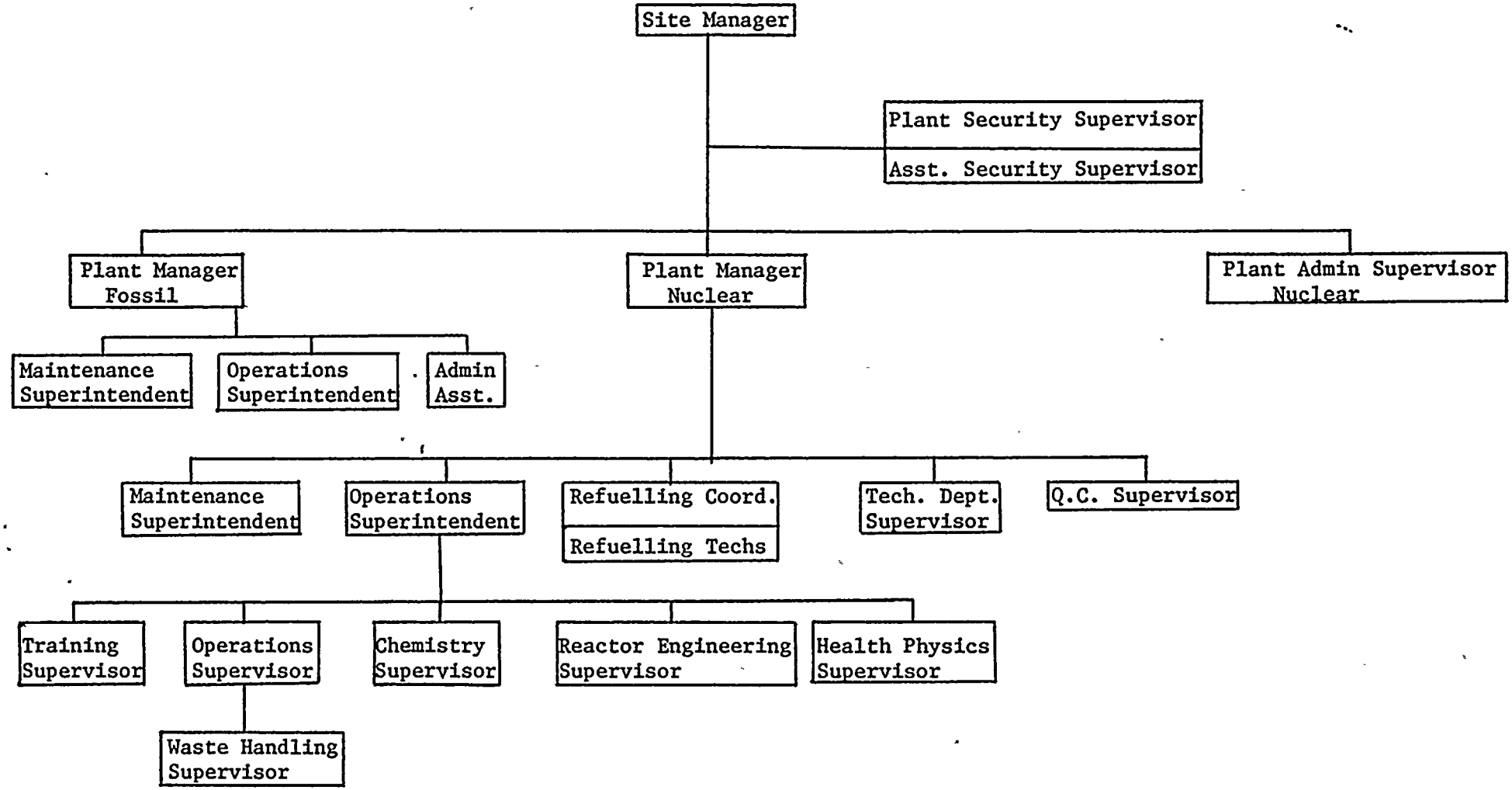

Fig. 2 TURKEY POINT HEALTH PHYSICS DEPARTMENT ORGANIZATION CHART