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

Report Nos. 50-321/80-27 and 50-366/80-27

Licensee: Georgia Power Company
270 Peachtree Street
Atlanta, GA 30303

Facility Name: Hatch

License Nos. DPR-57 and NPF-5

Inspection at Hatch site near Baxley, GA

Inspectors: _____ 9/5/80
C. M. Hosey Date Signed

for _____ 9/5/80
J. H. Davis Date Signed

Accompanying Personnel: L. G. Faust, Battelle Northwest Laboratories
W. T. Bartlett, Battelle Northwest Laboratories

Approved by: _____ 9/5/80
A. F. Gibson, Section Chief, FF&MS Branch Date Signed

SUMMARY

Inspection on June 16-27, 1980

Areas Inspected

This special, announced inspection involved 363 inspector-hours onsite in the area of health physics appraisal including radiation protection organization and management, personnel selection, qualificaitons and training, exposure controls, ALARA program, radioactiv waste management, facilities and equipment, and emergency response capabi ities.

Results

Of the seven areas inspected, no items of noncompliance or deviations were identified in six areas; two items of noncompliance were found in one area (Infraction - Failure to follow written procedures - Paragraph 8; Infraction - Failure to perform a safety analysis prior to making changes to the facility - Paratraph 8).

DETAILS

1. Persons Contacted

Licensee Employees

*M. Manry, Plant Manager
*C. T. Moore, Assistant Plant Manager
*T. Green, Assistant Plant Manager
*W. H. Rogers, Supervisor, Chemistry and Health Physics
*T. R. Collins, Laboratory Supervisor (Health Physics)
*D. Smith, Laboratory Supervisor (Chemistry)
M. Link, Laboratory Foreman
B. Hand, Laboratory Foreman
L. Willis, Laboratory Foreman
M. Squires, Laboratory Foreman
C. E. Belflower, Quality Assurance Site Supervisor
*G. E. Spell, Jr., Senior Quality Assurance Field Representative
*C. R. Miles, Quality Assurance Field Supervisor
G. Brantley, Radioactive Waste Supervisor
C. O. Barr, Unit 2 Maintenance Supervisor

Other employees contacted included 20 technicians, 4 operators, 10 mechanics, 5 security force members, and 6 office personnel.

NRC Resident Inspectors

*R. F. Rogers, Senior Resident Inspector
W. Barron, Resident Inspector

*Attended Exit Interview

2. Exit Interview

The inspection scope and findings were summarized on June 27, 1980, with those persons indicated in Paragraph 1 above. The inspector reviewed and examined all aspects of the health physics program at the facility. This review included the radiation protection organization and management, personnel selection, qualification and training, exposure controls, radioactive waste management, ALARA programs, facilities and equipment and emergency response capabilities. The inspectors stated that the areas of first-line supervision of the health physics technicians, increased technical depth of the health physics staff, turn-over rate in the health physics group, on-the-job training of technicians, contamination control practices should be reevaluated by the licensee. The licensee agreed to perform the evaluation. At the exit interview, the inspectors identified two items of noncompliance (Failure to follow written plant procedures and failure to perform a safety analysis prior to making changes to the facility (discussed in Paragraph 8)). The plant manager acknowledged the items of noncompliance. On July 2, 1980, additional discussions were held between the Acting Plant

Manager and members of the Regional staff concerning the plant's contamination control program and the assignment of chemical-radiation technicians. On July 3, 1980, a Confirmation of Action letter was sent to the licensee confirming actions to be taken to alleviate deficiencies in the plant's contamination control program and assignment of technicians.

3. Licensee Action on Previous Inspection Findings

(Closed) Deviation (321/78-15-05) Inadequate fume hood velocity. The inspector reviewed the results of the latest test of fume hood face velocities and had no further questions.

(Closed) Noncompliance (321/79-34-01; 366/79-38-01) Failure to provide inspector with immediate access to plant. The inspector reviewed the corrective action taken in response to this item and had no further questions.

(Closed) Noncompliance (321/79-34-02; 366/79-38-02) Failure to test filters in standby gas treatment system. The inspector reviewed the results of the most recent test of the SBGT system filters and reviewed the corrective action taken in response to this item. The inspector had no further questions.

(Closed) Noncompliance (321/79-34-03; 366/79-38-03) Failure to label containers of radioactive material. During tours of the plant, the inspector observed that containers of radioactive material were being properly labeled. The inspector had no further questions.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Listing of Noncompliance and Inspector Followup Items

The following is a summary tabulation of the noncompliance and inspector followup items identified throughout this report. Inspector followup items (IFI) are matters which will be examined in future inspections.

IFI (321/80-27-01) Additional supervisors for health physics (Paragraph 6.a).

IFI (321/80-27-02) Technical support personnel for chemistry/health physics group (Paragraph 6.b).

IFI (321/80-27-03) High turnover rate of health physics technicians (Paragraph 6.c).

IFI (321/80-27-04) Performance audits of radiation protection program (Paragraph 6.d).

IFI (321/80-27-05) Assignment of technicians to responsible positions (Paragraph 7.a).

IFI (321/80-27-06) Establishment of a formal on-the-job training program for technicians (Paragraph 7.a).

IFI (321/80-27-07) Full time training specialist for chemistry/health physics group (Paragraph 7.a).

IFI (321/80-27-08) Technical inaccuracies in general employee radiation protection training and retraining courses (Paragraph 7.b).

IFI (321/80-27-09) Test for general employee training (Paragraph 7.b).

IFI (321/80-27-10) Evaluation of Nitrogen-16 exposure (Paragraph 8.a(1)).

IFI (321/80-27-11) Management review of radiation exposure (Paragraph 8.a(4)).

IFI (321/80-27-12) Quality control checks of internal monitoring systems (Paragraph 8.b(1)).

IFI (321/80-27-13) Formal periodic evaluation of respiratory protection program (Paragraph 8.b(2)).

IFI (321/80-27-14) Improvement in respiratory protection training (Paragraph 8.b(2)).

IFI (321/80-27-15) Improved record keeping for SCBA tank hydrostatic test (Paragraph 8.b(2)).

Noncompliance (321/80-27-16) Failure to follow procedures (Paragraphs 7.b, 8.b.(2), 8.c.(2), 8.c.(3)).

IFI (321/80-27-17) Carbon monoxide monitor for plant air compressors (Paragraph 8.b(2)).

IFI (321/80-27-18) Air sampling in vicinity of air compressor suction (Paragraph 8.b(2)).

IFI (321/80-27-19) Determination of actual flow rates for low volume air samplers (Paragraph 8.c(2)).

IFI (321/80-27-20) Use of personnel friskers (Paragraph 8.c(3)).

IFI (321/80-27-21) Evaluation of personnel contamination monitoring instruments (Paragraph 8.c(3)).

Noncompliance (321/80-27-22) Failure to perform a safety evaluation (Paragraph 8.c(4)).

IFI (321/80-27-23) Scheduling shipments of solid radioactive waste (Paragraph 9).

IFI (321/80-27-24) Solid radioactive waste volume reduction training for plant staff (Paragraph 9).

IFI (321/80-27-25) Revise procedure for surveying shipments of radioactive waste (Paragraph 9).

IFI (321/80-27-26) Review of plant procedures by health physics staff (Paragraph 10.b).

IFI (321/80-27-27) Establishment of a formal ALARA program (Paragraph 10.d).

IFI (321/80-27-28) Isolation of the counting room in the event of high airborne radioactivity in plant (Paragraph 11.a).

IFI (321/80-27-29) Tritium analysis capability for the plant (Paragraph 11.b(2)).

6.0 Radiation Protection Organization and Management

a. Health Physics Supervision

The inspectors reviewed the radiation protection organization of the plant and how it relates to the overall plant organization. The supervisor of health physics and chemistry (radiation protection manager) reports directly to an assistant plant manager. The chemistry and health physics functions are essentially split below the supervisor of chemistry and health physics with a laboratory supervisor in charge of each functional area.

The laboratory supervisor in charge of health physics is responsible for six major areas, including personnel dosimetry, radioactive waste shipments, respiratory protection program, radiation protection training, instrument calibration and facility decontamination in addition to in-plant health physics. The laboratory supervisor has one foreman working for him, who is used primarily to review survey results, radiation work permits (RWP's) and to process other paperwork. The one foreman has little time to direct the day-to-day activities of the health physics technicians. Supervision of the daily activities of the technicians is performed to a limited extent by the laboratory supervisor. Technical direction of the plant technicians is provided to some extent by temporary contract technicians. A licensee representative stated that the plant was considering adding four additional foremen positions to the chemistry/health physics group to provide 24-hours-per-day, seven days-per-week supervisory coverage. The inspector stated that first line supervision of the health physics technicians should be strengthened by the addition of other laboratory foremen to the health physics group over and above the number necessary to provide round-the-clock supervisory coverage. These individuals should act as the first line supervisors of a small group of technicians, determine the health physics requirements for jobs (approve radiation work permits), review survey results and serve as the primary contact

in the health physics organization for personnel in other departments. The licensee should also consider the establishment of another laboratory supervisor position to cover the support functions such as dosimetry, counting room respiratory protection program, etc., in order for the laboratory supervisor for health physics to devote his full attention to the in-plant radiation protection program (321/80-27-01).

Technical Support

The supervisor of chemistry and health physics has no one on his staff, who does not have supervisory responsibilities, that could provide technical support to his staff. Sufficient technical support personnel at the plant is particularly important since the licensee has no corporate group that could provide technical assistance in the areas of chemistry and health physics. The lack of technical support has reduced significantly the time available for the laboratory supervisors to perform their assigned responsibilities under normal conditions and to prepare for anticipated off-normal conditions. Lack of technical support has also reduced significantly the time available for the supervisor of chemistry and health physics to assess and manage the plant's overall radiation protection program. The lack of technical support has also resulted in less than adequate consideration for such task as training of the health physics staff, investigating abnormal radiological occurrences, implementing an ALARA program and conducting performance audits or assessments of the plant's radiation protection program.

A licensee representative stated that additional staff had been requested several times over the last two years, without results. A licensee representative also stated that considerations had been given to promoting senior technicians or foremen to technical support positions. The inspector stated that there is a need for additional professional positions within the chemistry and health physics group. The individual(s) should have an educational background (but not necessarily the experience) sufficient to meet the radiation protection manager qualifications of Regulatory Guide 1.8 (321/80-27-02).

c. Technician Retention

During discussions of the radiation protection organization with licensee representatives, the high turnover rate of technicians was identified by the licensee as a significant problem. At the time of this appraisal, sixteen technicians were assigned to health physics, of which only seven had been employed at the plant for more than a year. A licensee representative stated that in the past two years, there has been almost a 100 percent turnover rate in the chemistry/health physics technicians (twelve individuals left in 1979 and eight departed in the first five months of 1980). Licensee management representatives stated that low pay and plant location were the principal reason technicians would not stay at the plant. Technicians interviewed by the inspectors, indicated that although low pay and location might

be contributing factors, the low esteem of e chemistry and health physics groups in relation to other company oups was a significant cause. An example provided to the inspector was the fact that a foreman in a particular job classification supervising unskilled laborers is paid more than a laboratory foreman supervising highly skilled technical employees. Although the inspector found no specific evidence to support a lack of management support for the radiation protection program, the consensus among the chemistry and health physics technicians was that the low moral within the groups, and the high turnover rate, was caused by a lack of management support of the group, lack of respect from other plant groups, and lack of real authority over the work with radiological consequences at the plant. The inspector noted that a reason for the turnover rate might be the plant's policy of only hiring technicians with two year degrees in radiation protection or four year degrees in a related field. Most of these individuals come from out-of-state. Individuals with this educational background will only stay in the technician ranks long enough to acquire the experience necessary to move into a supervisory or a professional position closer to home. The inspector stated that the experience level of the health physics staff has been reduced significantly. Hard working, dedicated technicians and supervisors are keeping the routine program going, however, it is questionable whether the health physics staff could handle off-normal or emergency situations. The licensee needs to take prompt and effective action to alleviate this high turnover rate of health physics technicians and to improve the overall moral of the chemistry and health physics group (321/80-27-03).

d. The inspectors discussed the audit program related to radiation protection with licensee representatives and reviewed the following audits performed in 1979 and 1980 by the quality assurance site supervisor and his staff:

80-SC-1, Station Chemistry and Radiochemistry, 2/23/80-3/31/80.

80-TR-1, HNP Departmental Training 5/29/80-6/12/80.

80-RWC-1, Radwaste Control Audit of Chem-Nuclear, Barnwell South Carolina, 1/30/80

79-RWC-1, Radwaste Control Program, Units 1 and 2

79-RWC-2, IE Bulletin 79-19, 8/21/79.

79-HP-1, Health Physics Program, Units 1 and 2, 2/27/79-3/2/79

79-HP-2, Health Physics Program, 9/3-11/79

The inspector noted that the audits performed by the quality assurance group were generally procedural in nature and were performed primarily to identify and correct noncompliances. The frequency, scope and

followup action on this type of surveillance and audit as they relate to the radiation protection program appeared to be adequate.

In discussions with plant health physics personnel, the inspectors found that neither health physics group nor the quality assurance group performs reviews or assessments of the effectiveness of the plant's radiological control program. The inspector stated that performance audits or program assessments should be routinely performed.

The reviews should be performed by individuals with extensive operational health physics experience (321/80-27-04).

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

(1) Supervisory control over technicians (Paragraph 6.a).

(2) Technical support for health physics/laboratory group (Paragraph 6.b).

(3) Retention of experienced health physics technicians (Paragraph 6.c).

(4) Performance audits or evaluation of the plant's health physics program (Paragraph 6.d).

7.0 Personnel Selection, Qualification and Training

a. Health Physics Staff

Technical Specification 6.3.1 states that, "Each member of the facility staff shall meet or exceed the minimum qualifications of ANSI N18.1-1971 for comparable positions, except for the Health Physicist-Radiochemist, who shall meet or exceed the qualifications of Regulatory Guide 1.8, September 1975." Paragraph 4.5.2 of ANSI N18.1-1971 states in part that, "Technicians in responsible positions shall have a minimum of two years of working experience in their specialty." Regulatory Guide 1.8, September 1975 states in part that, "The RPM should have a bachelor's degree or the equivalent in a science or engineering subject... should have five years of professional experience in applied radiation protection.... At least three years of this professional experience should be applied radiation protection work in a nuclear facility dealing with radiological problems similar to those encountered in nuclear power station ...."

An inspector evaluated the technical qualifications of the individuals on the health physics staff. The inspector reviewed the training and experience records, interviewed selected inidividuals and discussed the qualifications of the staff with a licensee representative. Three individuals on the permanent health physics staff meet the training

and experience requirements of ANSI N18.1-1971. For this appraisal one year of experience was considered to be 2000 working hours in not less than 40 weeks.

The licensee has identified the approval of radiation work permits for the health physics group as one task that requires ANSI qualified technicians. During the evaluation of technician qualifications, the inspector noted that the qualification of one technician serving in a responsible position was questionable. The individual had signed several RWP's. Although this technician had been employed in the health physics group for approximately 30 months; all but five months of this time had been completed primarily performing clerical duties associated with the plant's dosimetry program. A licensee representative responsible for certifying that on-the-job training had been satisfactorily completed and that the individual was qualified to perform specific tasks, stated that the individual was not fully qualified to sign RWP's. The inspector stated that technicians should not be assigned to responsible positions in specific areas (as defined by the licensee) until they have satisfactorily completed the on-the-job training in the specific area and have demonstrated proficiency in these areas (321/80-27-05).

The remaining thirteen technicians were in various stages of the technician training program and lacked the necessary training and experience to meet the ANSI requirements; however, they were not functioning in responsible positions.

The qualifications of the plant's supervisor of chemistry and health physics (radiation protection manager) were evaluated against the recommendations found in Regulatory Guide 1.8, September 1975. The supervisor of chemistry and health physics was found to meet or exceed all the recommended qualifications. The back-up for the supervisor of chemistry and health physics is a laboratory supervisor on his staff. This individual apparently meets or exceeds the requirements specified in Regulatory Guide 1.8, September, 1975 for a radiation protection manager.

Two laboratory supervisors report directly to the supervisor of chemistry and health physics. Both have approximately two years of college training, and more than seven years experience. One supervisor is responsible for the chemistry and counting room activities while the other is responsible for health physics. Each has received specialized training in their respective specialties, radiochemistry and radiation protection. Both of these individuals were extensively questioned during the appraisal and apparently have sufficient experience, training and knowledge to qualify as professional-technical staff in accordance with ANSI N18.1-1971.

The company requires permanent technicians to have either a two year degree in radiation protection or a four year college degree in a related science. Most permanent technicians are employed with a four year college degree and no related experience. Within approximately six months after employment, permanent technicians must complete a five week training course in basic health physics and enter the on-the-job training (OJT) schedule, and are assigned to one of eight primary health physics tasks. No goals for completion of the OJT have been established. A similar OJT program has been established for chemistry technicians. Chemistry technicians are responsible for whole body counting and the counting room.

A review of the Health Physics Technicians OJT records indicated that only one of the 16 permanent plant HP technicians had been qualified in all eight HP OJT tasks. The supervisor of chemistry and health Physics considered two other technicians qualified in accordance with ANSI N18.1-1971, but one of these technicians was qualified in only one OJT task and the other was qualified in three OJT tasks. The technician qualified in three tasks stated that he did not feel qualified to perform one of the tasks for which he was officially qualified (Based on fact that he had not performed the duties of the task for many months). He was not aware that there was a formal OJT training program. The technician considered ANSI qualified and who had completed one OJT task had been placed in a responsible position for which he had not been qualified in accordance with the OJT procedure. Other technicians were qualified in one or two tasks, but did not have sufficient experience to be considered qualified as per ANSI N18.1-1971.

It was apparent to the inspector that the OJT program was a method of assigning job responsibility rather than an effort to train the HP technicians in a systematic fashion. The lack of awareness of the OJT program by the HP technicians, the failure of management to establish goals for completion and timetables, and the failure to move technicians from task to task indicates the OJT program does not in reality exist or achieve its purpose of training. Technicians remain highly specialzed in one particular job assignment, but have little or no ability to move to another HP specialty area. The inspector stated a formal on-the-job training program should be established (321/80-27-06).

A review of the training records revealed that some of the technicians had been to short courses which were directly related to their job responsibilities.

Laboratory foreman have been selected from qualified plant technicians. The foreman must be able to perform all specialty tasks and have satisfied the laboratory supervisor that he is able to coordinate the activities of the technicians.

The inspector reviewed the training and experience records of contract health physics technicians. Selected technicians were interviewed. Six technicians met the qualifications of ANSI N18.1-1971 and were

performing in responsible positions. Two contract technicians were not ANSI qualified and were not being used in responsible positions. The licensee requires contract personnel to be familiar with all plant radiation protection procedures before being assigned to responsible positions. The foreman is responsible for documenting the contract technician's review of the procedures.

Technical Specification 6.4 states that a retraining and replacement training program for the facility staff shall be maintained and shall meet or exceed the requirements and recommendations of Section 5.5 of ANSI N18.1-1971. Section 5.5, ANSI N18.1-1971, states that a training program shall be established which maintains the proficiency of the operating organization. An inspector discussed the training/retraining program for health physics technicians with licensee representatives and reviewed selected training records of technicians. Plant procedure HNP-207 (issued 6/13/80) establishes a formal job-related retraining program for health physics personnel. Discussions with licensee representatives revealed that retraining schedules had not been prepared, nor was the staff available to develop lesson plans, prepare and conduct the training sessions. The inspector stated that training/retraining of health physics technicians should be raised to a high priority within the chemistry/health physics group and that action be taken to insure that an effective training program for the chemistry/health physics staff is in place. The licensee should consider assigning an individual to the chemistry/health physics staff to organize and manage a formal staff training program (321/80-27-07).

During tours of the plant, the inspector observed health physics personnel (plant staff and contract technicians) performing surveys and discussed the methods for controlling work in radiological controlled areas with health physics personnel and other members of the plant staff. Although most individuals questioned had adequate knowledge of radiological conditions, protective clothing requirements, work to be performed and basic health physics principles, the following occurrences point out the need for more extensive training of the chemistry/health physics staff:

(1) One June 23, 1980 an inspector observed a chemistry technician leaving the radiation control area. The technician left the hand and foot monitor after it alarmed and proceeded to take a chemistry sample (pre-treatment gas and post-treatment gas) into the counting room. When questioned by the inspector the technician stated that the hand and foot monitor alarmed because of the "hot" sample he was carrying. At the inspector's request, the technician frisked his hands with a RM-14 with HP-210 probe and found them to be contaminated to approximately 2,000 dpm/probe area. When questioned concerning the contaminated hands, the technician stated that his hands were irradiated and not contaminated, and that the hot sample set off the hand and foot monitor. The inspector stated that discussions with the technician indicated that the technician did not have an adequate understanding of

radiation vs. contamination nor was he thoroughly familiar with plant radiation protection procedures. Plant Procedure HNP-8009, Personnel Contamination Survey, states that all personnel contamination shall be immediately reported to health physics. Failure of the technician to report the hand contamination to health physics is an example of failure to follow procedures as required by Technical Specification 6.8.1 (321/80-27-16).

(2) An inspector observed a health physics technician walk up to a high radiation area sign at the entrance to the northeast diagonal in the reactor building and change the posting to a radiation area. When asked to see the survey of the area upon which the down grading was based, the technician stated that no survey had been performed and that the change was made because the high pressure coolant injection system had been shut down and the source of the high radiation in the area had been eliminated. After the discussion, the technician returned to the area and performed a survey to verify that the high radiation area did not exist in the N.E. diagonal. In discussions with licensee management, the inspector stated that it is prudent to base changes in posting of areas on actual surveys, rather than on intuition.

b. Radiation Protection Training for Plant Staff and Visitors

Plant Procedure HNP - 203, General Employee Training, requires that all plant personnel successfully complete the radiation protection training. General employee training records are maintained by the training department. An initial 8 hours of training is required for all personnel and includes radiation safety, security and emergency procedures. An annual retraining of plant personnel is required and includes the same basic information given in initial training. The inspector attended both sessions and noted the following deficiencies in the radiation protection training:

(1) Visual aids were not used in the retraining session. The visual aids used in initial training contained many technical errors.

(2) The definitions of terms such as radiation and contamination were either not given or were over simplified to the point of being incorrect.

(3) The concept of ALARA was not formally presented or its importance discussed.

(4) No reference made to minimizing radioactive waste generated.

(5) Biological effects of high levels of radiation exposure were not formally discussed, although the instructor was asked questions regarding biological effects and questions about biological effects appeared on the test.

(6) Personnel were advised that a dose of 2 to 3 rem would require blood tests.

(7) None of the quesions asked of the instructor were adequately fielded. There was an apparent lack of understanding of the questions or an inability to provide technical answers. The concept of neutron activation was not adequately discussed by the instructor when brought up by class participants.

In reviewing the qualifications of the instructor, it was observed that this individual was the only health physics technician who had completed the licensee entire technician training course (classroom training and on-the-job training). During discussions with the inspector, the individual had difficulty answering questions concerning basic health physics principles. In discussing the qualifications of the instructor to teach the radiation protection aspects of the general employee training, a licensee representative stated that he thought this individual could perform an adequate job. The inspector stated that the accuracy of basic information could be improved by using a video tape presentation or a formalized script with the appropriate visual aids. However, the instructor must be able to answer questions asked of him in a simple but factual manner. The inspector also stated that deficiencies in the training should have been identified and corrected by plant management and supervisory health physics personnel who attended similar sessions prior to the appraisal (321/80-27-08).

An individual must satisfactorily complete a written test to receive credit for attending the general employee training. The same test is used for a year for both training and retraining. Failure to have several tests reduces substantially the benefit of the test, which is to determine if the individual has a basic understanding of radiation protection principles and limits. In addition, the uses of objective type questions (true-false, multiple choice, etc.) further reduces the benefits of the test. The inspector stated that several tests should be prepared and should include some short answer essay-type questions (321/80-27-09).

The training facilities did not provide an atmosphere that was conducive to learning. The air conditioner in the room made it impossible to hear the instructor from the back of the room, and when it was turned off the room became uncomfortably hot. Licensee representatives stated that they were aware of the problem and the air conditioner was to be moved out of this room.

The inspector reviewed selected general employee training records and found no instance where retraining had not been performed as required by Plant Procedures.

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

(1) assignment of health physics technicians to responsible positions (Paragraph 7.a).

(2) development of a formal on-the-job training program (Paragraph 7.a).

(3) management of the chemistry/health physics training program (Paragraph 7.a)

(4) development of methods to ensure instructors for the general employee radiation protection training are qualified to teach the subjects they are assigned (Paragraph 7.b).

(5) technical accuracy of the general employee radiation protection training/retraining course (Paragraph 7.b).

8. Exposure Control

a. External Exposure Control

(1) Monitoring

The licensee utilizes a commercial TLD service for monitoring personnel for both beta-gamma and neutrons. This program consists of a multi-chip TLD system and measures doses from gamma, penetrating beta, low energy (skin) beta and soft x-rays as a matter of routine. Neutron exposures are reported to the plant in raw counts. The licensee applies a predetermined count-to-dose conversion factor to determine the neutron dose. These are then added to the whole-body penetrating results on a monthly basis for those personnel entering areas requiring neutron monitoring. Background controls are kept on the rack containing the personnel TLD's at the entrance to the protected area.

The TLD's are supplemented with extremity TLD's for use in special situations in which significant extremity doses are expected to be encountered. Special TLD's are employed to supplement the regular whole body monitoring device whenever directional beams of radiation are expected and the normal TLD may not provide adequate monitoring. While the TLD is the standard and its results are used as the official record of dose, it is supplemented by self-reading pocket dosimeters for day-to-day exposure control. Pocket dosimeters in the 0 to 200 mR and the 0 to 1 R range are used. Pocket dosimeters are read once each 24 hours and totaled weekly. Comparisons are made on a monthly basis with the TLD results for the same time period. Any discrepancy greater than 20% between the pocket dosimeter and TLD are flagged on the computer printouts. These discrepancies are then investigated to determine any corrective action that may be required.

The investigations conducted to determine why differences greater than 20% exist include a review of exposures recorded on radiation work permits (RWP), exposures received by individuals doing similar work and by discussions with the personnel involved. These actions are recorded and filed with the individual's exposure record.

In the event that a TLD is lost, the pocket dosimeter results are used for the period in question and to be conservative the value is increased by 20%. That dose is then entered into the individual's exposure file and the file corrected to reflect the total exposure. The inspector stated that the practice of increasing the pocket dosimeter reading by 20% when TLD is lost should be reviewed. There is no justification for making this adjustment in the dose assigned.

The licensee is currently evaluating a TLD system which may ultimately replace the commercial dosimetry service. This system is currently used only for special studies and to supplement the vendor-provided TLD.

TLD's exposed to known doses along with controls are submitted to the commercial dosimetry service on a quarterly basis for evaluation. The vendor has no prior knowledge of which TLD has been exposed. Exposures are made with a Cs-137 calibration source. TLDs are exposed to 50, 100, 200, 1000 and 2400 mR. In all instances reviewed, the interpreted results from the vendor are low by about 15% using the licensee's exposure data as the real value. This value is determined with a Victoreen Condenser R. Meter. No TLDs exposed to known neutron doses are submitted to the vendor for evaluation.

The licensee at present cannot evaluate exposures as a result of high energy photons i.e. Nitrogen-16. there is some question about the magnitude of N-16 radiation levels near the turbines while operating at power. The licensee should consider conducting an investigation to determine if special monitoring is required when entries are made into the turbine bay at power (321/80-27-10).

(2) Records

Exposure records are maintained by health physics personnel. At the time of the appraisal there were two health physics technicians and one clerk working in external exposure control. The licensee's dose records system is totally computerized with monthly and quarterly read-outs for the TLD's and weekly logs for the pocket dosimeter readings.

(3) Quality Control

Quality control checks of the TLD system are described in Plant Procedure HNP-8022. The pocket dosimeter calibration is described in HNP-8108 and reflects the recommendations of ANSI Standard

N-13.5 (1972). All exposures of TLDs used for quality control checks are verified with a Victoreen Model 570 condenser R-meter corrected to standard temperature and pressure.

(4) Management Review

There appears to be no continuing management review of radiation exposure data outside the Health Physics staff. There was no evidence that dose trends had been prepared or reviewed. Two tables containing exposures for plant personnel by department were reviewed for the period 1/1/80 - 4/21/80 and for some contractors for the period of 3/3/80 - 4/21/80. The data for the contractor employees was erroneous (Average exposure for individuals was greater than the maximum exposure for the same individual.) With the exception of errors in arithmetic, the errors could not be reconciled. Apparently, a change in technicians had occurred between the time the data was prepared and the time of the appraisal and the documentation of raw data was insufficient to allow the new technician to reconcile the errors. Radiation exposures of plant workers and contractors should be reviewed by plant management periodically to insure that records are accurate and exposures are kept ALARA (321/80-27-11).

(5) Limits

Radiation protection programs, responsibilities, limitations and classifications are described in plant procedures HNP-8001-8005. The licensee has established an administrative exposure limit of 300 mrem/week. To exceed 300 mrem/week, written approval of the employee's immediate supervisor and a laboratory foreman is required. An administrative quarterly limit of 1250 mrem is used at the plant. However, the limit can be extended to 2500 mrem with plant management approval. All female employees in the protective area must acknowledge in writing that she has received instructions concerning prenatal exposures. Administrative guides for women are 500 mrem per two month period, unless a higher exposure is requested by the employee, her supervisor, and the laboratory foreman; 500 mrem is the limit applied during the gestation period unless higher exposures are requested. Non-plant workers are limited to 300 mrem per quarter and must furnish current exposure records. With completed records these personnel may receive 1250 mrem/quarter. In all instances, the administrative controls appear to be adequate.

b. Internal Exposure Control

(1) Monitoring

The internal exposure control program was reviewed for adherence to ANSI N343-1978 and Regulatory Guide 8.9. A whole body counting system is available and has thyroid and torso counting capabilities.

Each year, approximately 20% of the plant personnel are selected for urinalysis by a private vendor. Urinalysis is also performed on personnel suspected of internal deposition of radioactive material. An adequate system of documentation, action levels and records review has been established. The inspector concluded that the internal dosimetry program was adequate.

A quality assurance program has been established for auditing compliance with procedures. No independent quality control methods (such as spiking urine samples or analysis of unknowns in the whole body counter) have been developed. The inspector stated that a program should be established which periodically checks the accuracy of internal monitoring systems (321/80-27-12).

Procedures are available for the Bioassay Program (HNP-8021) and the Whole Body Counter System (HNP-8134). Although these procedures do not reference Regulatory Guide 8.9 or ANSI N343-1978, the methods are similar to those recommended.

The whole body counter system has been automated by a private vendor. A 3" x 3" Na(I) detector for thyroid monitoring and a 4" x 4" Na(I) detector for torso monitoring are interfaced with a multichannel analyzer and data processing system. The data processing system can automatically identify nine isotopes of interest and calculate percent body burden and dose commitment. A system of multiple peak location along with a branching ratio factor are used for positive identification of the isotopes. If the spectra can not be identified by this screening method, then the program identifies the isotope as an unknown and the technician (or his supervisor) must supply additional information for automatic identification and calculation. A Na-22 source is used daily to verify and adjust gain settings. An energy calibration is performed daily. A complete calibration of the system is performed annually with NBS traceable sources supplied by a private vendor. Initially there were difficulties with identification of low-energy gamma emmitters. This problem was recognized and corrected. The sensitivity of the system allows identification of less than one tenth of a percent body burden for most gamma emmitters, and there is a formal action level of 10% of body burden. As a matter of routine, technicians investigate the cause of any isotope identified.

During the last 18 months, six persons were identified who had been exposed to airborne radioactivity or high levels of contamination. A review of these records indicated that each had received a whole body count and the records had been reviewed by supervisory personnel. The whole body count had indicated internal deposition of I-131, Zn-65, Co-60 and Mn-54. The levels identified were well below required action levels.

A personnel contamination report file is maintained by the Health physics supervisor. Six of nine persons had been contaminated above the action levels for personnel contamination and each had received a whole body count. All contaminated persons were found to be externally contaminated with no internal deposition.

Procedures have been developed in accordance with 10 CFR 20 and the needs of the plant. The following procedures were reviewed and personnel were questioned concerning the use of these procedures:

Radiation and Contamination Control	HNP-8005
Radiation Control Area Classifications	HNP-8003
Radiation Exposure Limits	HNP-8002
Decontamination	HNP-S006
Personnel Contamination Survey	HNP-8009
Protective Clothing Dressing and Undressing	HNP-8011

These procedures appeared to be adequate for the needs of the plant.

Airborne Radioactivity areas are posted when levels approach 25% of maximum permissible concentration specified in 10 CFR 20, Appendix B, Table 1. Airborne areas observed during the appraisal were adequately posted and samples were taken frequently and analyzed for isotopic content. Personnel were restricted from all areas until a complete evaluation of the problem could be completed.

(2) Respiratory Protection Program

The respiratory protection program was evaluated on the bases of training program, medical qualification, procedures, equipment, engineering controls, maintenance program, quality assurance and air sampling. Although air sampling was examine as it related to the respiratory protection program, it is discussed in greater detail in paragraph 8.c.

The licensee's respiratory protection program was addressed in Procedure HNP-8010, Use and Care of Respirators. Procedure HNP-8010 does contain all the requirements of Regulatory Guide 8.15. Evaluation of program effectiveness was based primarily on bioassay results and followup of known cases of personnel contamination. This procedure included a policy statement which addressed subjects specified in Regulatory Guide 8.15. The policy statement specified that the licensee will periodically evaluate the respiratory protection program. At the time of the inspection this evaluation was only done informally by the health physics staff and no documentation was maintained. The inspector stated that this aspect of the respiratory protection program

could be strengthened by a periodic formal audit complemented with documented findings. Documentation would allow recurrent problems to be high-lighted and corrected (321/80-27-13).

An individual was assigned as the person responsible for the respiratory protection program as recommended by NUREG-0041, Manual of Respiratory Protection Against Airborne Radioactive Materials. However, this was one of many responsibilities borne by this individual. (See paragraph 6.a)

The licensee uses MSA respiratory protective equipment exclusively. Licensee representatives stated that the possibility that some workers might not be respirator qualified due to improper fit was offset by the desirability of maintaining only one manufacturer's line of equipment.

Approximately three hundred fifty full-face air purifying respirators and approximately fifty-three self contained breathing apparati (SCBA) were in stock at the licensee's facility. Approximately 114 SCBA tanks were available for use. Combination cartridges consisting of a particulate filter and an adsorbent (approval number TC-14G-105) were available. However, licensee representatives stated that no protection factor credit was taken against radioiodine.

The licensee's system to assure wearer qualification consisted of a master list of plant workers which indicated pertinent limitations. Qualified wearers also were issued wallet cards which stated that the individual was respirator qualified.

Discussion with licensee representatives and observation of posted warning signs revealed that the licensee had identified certain areas within the plant as having a potential for life-threatening atmospheres under certain conditions. Sentox II oxygen/combustible gas monitor, Drager multi-gas detector and MSA combustible gas and oxygen indicators were available for use in identifying life-threatening atmospheres. Procedures were available addressing use and calibration of these units.

The licensee's program for sampling air for radioactivity consisted of routine use of air monitors (CAMS and CIM/CAMS) at certain locations within the plant; routine use of low-volume air samplers equipped with particulate filters and adsorbent cartridges for gases; and the use of high-volume air samplers for Radiation Work Permit tasks and other circumstances when deemed appropriate by the health physics staff. Licensee representatives stated that no lapel (individual) samplers were used at the facility. The air sampling program is discussed in detail in paragraph 8.c.

Discussions with licensee representatives and observations made during plant tours revealed that attention was being directed toward control of airborne radioactivity by application of engineering controls. However, airborne radioactivity levels associated

with Unit I were significantly greater than those associated with Unit II. These elevated airborne levels point toward the necessity of continued and enhanced efforts to apply engineering or process controls where practicable. At the time of the inspection no attempt had been made to perform air sampling trend analyses to aid in determining the effectiveness of attempts toward engineering or process controls. An inspector discussed with licensee representatives the merits of trend analyses for this purpose.

By examination of outstanding and completed Radiation Work Permits, for the second quarter 1980, and discussion with licensee representatives, an inspector determined that airborne radioactivity hazards were considered prior to beginning work in such areas. Examination of air concentration values stated on RWP's revealed that virtually all respirator assignments were made on the basis of potential for exposure exposure to airborne radioactivity rather than actual air concentrations.

An inspector attended an initial training session on June 12, 1980, for individuals attempting to become qualified wearers of respiratory protective equipment. The training consisted of a video tape presentation, lecture with questions and answers, demonstrations of donning, fitting and testing, and removing respirators, and finally individual exercises including fitting and testing. The video tape covered the basic requirements of Regulatory Guide 8.15 and NUREG-0041. The merits of a more thorough discussion of the concept of exposure to airborne radioactivity were discussed with the instructor. During the practical phase of the training, the instructor demonstrated the use of full-face respirators, air-line respirators and SCBA units. The demonstration was followed by individual exercises in donning, wearing and removing the various respiratory protective devices. Each individual was required to be fitted and tested for full face respirators, air-line respirators and SCBA. The full-face respirator was fitted and tested using a challenge atmosphere of amyl acetate in a closed building. Within the limitations of qualitative fitting, which is subjective, the testing method appeared to be satisfactory. The practical aspects of the respiratory training program were carried out most effectively.

An inspector attended an annual retraining session on June 18, 1980, in which respiratory protection was discussed along with other health physics topics. Questions asked by those in attendance indicated they had a poor understanding of the basic concept of exposure to airborne radioactivity. Apparently several attendees did not have a clear understanding of maximum permissible concentrations (MPC) and the relationship between MPC and time (MPC-HR). An inspector disucssed with the instructor the merits of a more thorough explanation of individual exposure to airborne radioactivity. (321/80-27-14). During the annual retraining session no practical exercises or drills were included.

Physical examinations to determine fitness for wearing respirators were performed one of two ways: (1) the licensee retains the services of a mobile medical unit which makes routine visits to the facility or (2) individuals whose medical examination needs do not coincide with mobile unit visits are examined by local physicians. In either case the final determination of fitness to wear a respirator is made by a physician. An inspector reviewed items included in each examination and determined that the medical evaluation program met the requirements of Regulatory Guide 8.15 and the recommendations of NUREG-0041. An inspector examined a medical clearance list which indicated due dates and completion of annual medical reviews. This list specified those individuals found medically unfit to wear respirators.

An inspector selected individuals who had been included on RWP's requiring respiratory protection and verified that these individuals were included on the authorized user listing available to the individual issuing respirators. This listing included both medical and training authorizations and verified the status of the individual's limitations and qualifications.

Three licensee employees have completed a training course offered by the manufacturer pertaining to inspection, testing and repair of respiratory protective devices and components. Discussion with the trained individuals revealed that inspection and repair of regulators was especially emphasized during the course. Most recent training was completed in February, 1980.

Procedure HNP-8010, required that regulators be tested every six months using a portable regulator tester. Examination of inspection and testing records for 1979-1980, revealed that these tests had been performed at six-month intervals.

Procedure HNP-8010 required hydrostatic testing of SCBA tanks at five and three year intervals depending on the type of material from which the tank was made. This information was logged in the SCBA inventory log and was also stamped on the bottle (tank). An inspector discussed with licensee representatives the merits of a more complete log sheet which would display the history of a particular tank including date of acquisition, each date of inspection and associated problems (321/80-27-15). The log sheet in use presented the most recent hydrostatic test date and the due date for retesting.

HNP-8010 required respirator users to return respiratory protective equipment to designated locations (special containers or the health physics office). On several occasions, inspectors observed full-face respirators discarded on the floor and left after use. This was pointed out by the inspectors as an example of failure to follow procedures as required by Technical Specification 6.8.1 (321/80-27-16).

After use, the face-pieces were surveyed for gross radioactivity prior to cleaning. The cartridges were removed and discarded. No attempt was made to test and reuse the cartridges. The face-pieces were washed in warm soapy water using either a sink or a dishwasher located in a room adjacent to the health physics office. The face pieces were hung on pegs on a wall-mounted board to air dry. HNP-8010 required smearable contamination levels on the face pieces to be less than 1000 dpm/100 cm^2 beta-gamma radiation. Discussions with technicians participating in this activity and the laboratory supervisor (health physics) revealed that no determination of smearable radioactivity was made. The inspectors cited this as another example of failure to follow procedures as required by Technical Specification 6.8.1 (321/80-27-16).

After cleaning, the respirators were sealed in plastic bags and stored in cabinets until needed. An inspector examined several face-pieces in storage and observed that the masks appeared to be properly sealed and were pliable. None appeared to have taken a set. Cartridges were stored in the same room and were readily available for use.

SCBA tanks were filled with compressed air from a breathing air compressor located onsite. An inspector observed the compressor, examined the procedure and reviewed the inspection and maintenance log posted at the unit, and had no questions.

The principal source of in-plant breathing air used in the respiratory protection program was the plant air system. This air was compressed by six oil-based compressors. This system was not equipped with a carbon monoxide nor a heat alarm as recommended by NUREG-0041. The licensee had recognized this as a problem, and had submitted a Design Change Request to install the alarm in January 1978. However, this task apparently became associated with a Request for Engineering Assistance made to the parent company and had not been implemented. The inspectors expressed concern regarding the delay in correcting this licensee identified problem (321/80-27-17). Licensee representative stated that no oxygen was used in the respiratory protection program; therefore, no potential existed for intermingling breathing supplies.

An area the plant air system compressors take suction from of potential air borne radioactivity. The inspectors recommended that the licensee be prepared to do air sampling in the area where the plant air system compressors take their supply in the event air line respiratory protection is necessary under abnormal conditions (321/80-27-18).

Examination of Air Quality Test records for 1980 revealed that Class D quality air was verified every 45 days as required by Procedure HNP-8010. These tests were performed by an outside

laboratory and included moisture content, hydrocarbons, carbon monoxide, and carbon dioxide. No Class-D values for these contaminants were exceeded in any test for 1980.

One SCBA sealed ready-for-use pack was opened on June 26, 1980, at the request of an inspector. The tank inside contained only approximately 900 pounds of air instead of the 2200 pounds recommended by Procedure HNP-8010. This, of course, would limit the service-life for the user. The attached inspection tag indicated the pack had been inspected on June 2, 1980. A licensee representative removed the unit from ready-for-use status and stated that the unit would be reinspected.

c. Health Physics Surveillance and Access Control

(1) Posting, Labelling and Control

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 material during tours of the facility. In a few insolated instances, segments of control barriers had been taken down to permit access and had not been properly replaced. In such cases observed by the inspectors, the warning signs had not been removed from the scene but their effectiveness was reduced in that they had been moved aside or were lying on the floor. The inspectors pointed out that workers should be reminded during the general employee training and safety meetings of the importance of warning sign and barriers for the protection of other workers who might come into the area. The overall posting and control of radiologically controlled areas appeared to be adequate.

An inspector examined several procedures which covered various aspects of the licensee's health physics surveillance program. Four procedures examined which has significant bearing on radiological surveys were: (1) HNP-8005, Radiation and Contamination Control, (2) HNP-8012, Radiation and Contamination Surveys, (3) HNP-8013, Airborne Particulate Radioactivity Concentration Determination; (4) HNP-8050, Survey Frequency and Work Scheduling.

An inspector reviewed selected records of radiation and contamination control surveys performed between May 1, 1980 and June 17, 1980. Survey records showed that when removable contamination exceeded the licensee's action level of 1000 dpm/100cm^2, decontamination efforts and resurvey results were usually documented. comments calling attention to special needs such as changing step-off pads were included on the survey forms.

(2) Airborne Radioactivity

An inspector reviewed selected records for airborne radioactivity. Routine air sampling records were available for low-volume air sampling, which was used for general area air sampling, and high-volume air sampling, which was used for areas with high potential or known airborne radioactivity.

Examination of low-volume air sampling records for the period April 1, 1980, to June 19, 1980, revealed that on at least twelve occasions, gross beta-gamma radioactivity collected on the filter or cartridge exceeded 1×10^{-9} µCi/ml. Apparently no followup isotopic analysis had been performed as required by Procedure HNP-8013. Licensee representatives were informed that this was another example of failure to follow procedures as required by Technical Specification 6.8.1 (321/80-27-16).

During plant tours, an inspector observed that the rotameters attached to the low-volume air samplers were covered with tape in some cases and that flow indication comparisons were inconsistent. Discussion with licensee representatives revealed that the flow meters were not used for determinations of sampler flow rates. Instead, licensee representatives stated, a portable magnahelic gauge was used to measure the flow rate of the individual air samplers once each quarter and the resulting value was used as the flow-rate until the check was performed the next quarter. The inspector expressed concern that no attempt was made to determine airflows through the sampler at the beginning and end of the sample period to correct for possible dust loading or other changes which might affect air flow rates. Examination of the quarterly rotameter test results for fourth quarter 1979 and the second quarter 1980, revealed differences of up to a factor of five for the same air sampler from one quarter to the next. Test results records were not available for the first quarter 1980, but portions of the data were available from the air sample records. Examiniation of selected air sample results for the period April 19, 1980, to June 23, 1980, revealed no cases which would have led to failure to post an airborne radioactivity area or failure to identify an area with airborne radioactivity concentrations greater than MPC, after corrections were made for the flow rate differences reflected in the quarterly air flow test results.

Discussion with licensee representatives and examination of the adsorbent cartridge holder revealed that the cartridge did not fit properly in the holder. The cartridge holder was an ICH-1 designed to hold IC-1 iodine cartridge (2 1/2 inches in diameter). The cartridge in use was a 2 1/4 inch diameter CESCO cartridge. The improper cartridge size appeared to allow varying degrees of leakage around the cartridge. The inspectors expressed concern regarding inaccuracy in air flow determinations associated with

air sampling and pointed out the potential for unidentified airborne radioactivity areas. The inspectors stated that the proper cartridges should be used with the low volume air samplers, that the samplers should be equipped with properly calibrated flow meters, and that air flows be recorded at the beginning and end of each sample period as recommended in American Standard N13.1-1969, Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities (321/80-27-19).

An inspector examined high-volume air sample results for the period May 1, 1980, to June 1, 1980. Isotopic analyses had been performed for samples exceeding 1 x 10^{-9} µCi/ml gross beta-gamma radioactivity. MPC fractions had also been determined. A cross check of Radiation Work Permits (RWP's) for this period revealed that airborne radioactivity determinations had been made for areas covered by RWP's. For individuals involved in work in airborne radioactivity areas, entries had been made into an MPC-Hr log as required by 10 CFR 20.103. Examination of the MPC-Hr log for 1980 revealed no individual seven-day cumulative exposures in excess of the 40 MPC-HR control measure specified in 10 CFR 20.103.

The inspectors reviewed the radiological control of tasks performed under Radiation Work Permits (RWP's) by observation of task assignments, examination of procedure HNP-8008, Radiation Work Permits, discussion with licensee representatives responsible for determining RWP requirements, and examination of current and completed RWP's. Examination of RWP files for June 1980, revealed that proper consideration had been given to radiological hazards associated with tasks performed under RWP's. Contamination control, beta exposure, air concentration, dosimetry and special precautions had been addressed on the RWP's examined. An inspector verified that data accumulated on RWP's was sufficient to allow the licensee to properly determine potential intakes of airborne radioactivity for inclusion in the MPC-Hr log.

Continuous air monitor (CAM) and continuous Iodine Monitor (CIM) data were recorded for both Units 1 and 2 in the Health Physics Log Book daily. Several areas associated with Unit 1 have been recognized by the licensee as warranting improved engineering controls. This concern was supported by CAM and CIM monitoring data and by high volume and low volume air samples. Airborne radioactivity increased significantly in Unit 1 reactor building and the turbine building immediately following a SCRAM. Also, the Unit 1 rad waste building experienced significant increases in airborne radioactivity during the first quarter 1980, expecially during centrifuging operations.

Discussions with members of the Engineering Services staff and examination of data from the turbine building CAM revealed that engineering controls associated with steam seal feed value controls have been effective in reducing the airborne radioactivity problem. Comparison of airborne concentrations associated with the SCRAM on May 20, 1980, prior to engineering adjustments and the SCRAM on June 26, 1980, following the adjustments showed a significant reduction in airborne concentrations. However, further steps were planned by the licensee to attempt continued reductions in airborne concentrations. The licensee is required by 10 CFR 20.103 to apply engineering and process controls to the extent practicable to maintain airborne concentrations below 25% of MPC (the level which delimit an airborne radioactivity area).

(3) Contamination Control

During plant tours, the inspectors verified the alarm point settings on approximately fifteen RM-14 and RM-16 survey instruments (friskers) which were used by workers to monitor themselves, and articles which they might be carrying, for radioactive contamination. Generally, the instruments were set to alarm at approximately 200 counts per minute above background. This alarm setting corresponds to approximately 2000 disintegrations per minute per 100 cm^2, which is greater than the licensee's procedural limit of 1000 dpm/100 cm^2 for unrestricted areas. The inspectors also noted confusion on the part of plant workers as to when the friskers in the plant are to be used. Although signs are posted near each instrument stating "Frisk Before Passing This Point", workers were unclear whether they had to frisk when passing the frisker from all directions and to what extent they should frisk (feet and hands or whole body). The inspectors stated that the worker should have a clear understanding of the purpose of the friskers, when they should be used and how. The signs should specify what should be done if the frisker alarms while an individual is frisking. The friskers should be set to alarm at the plant's unrestricted release limit. Temporary shielding should be considered if background radiation level preclude the use a frisker in a location where one is desired, rather then increasing the alarm setpoint (321/80-27-20).

On June 16, 1980, one of the inspectors and a licensee representative had their shoes contaminated while touring areas of the plant which were "clean". (Contamination levels less than 1000 dpm/100 cm^2. The inspectors observed the control point at the exit from the radiation control area and noted that approximately 2 out of 5 individuals were exiting from Unit 1 with contaminated shoes and/or hands. In discussion with licensee representatives, the inspectors learned that this was typical. After discussions with the inspector, a licensee representative initiated action to have the Unit 1 reactor building surveyed for smearable contamination and decontaminated, when necessary. Decontamination efforts

began on June 17, 1980 on the 158' and the 185' elevations of the Unit 1 reactor building. A licensee representative stated that the Unit 1 reactor building generally became contaminated as the result of airborne radioactivity when the plant tripped. Plant procedure HNP-8009, Personnel Contamination Survey, states that all personnel contamination shall be immediately reported to health physics. On June 24, 1980 a worker was observed leaving a hand and foot monitor after it alarmed with indications that the hands and feet were contaminated. The worker proceeded to wash his hands and clean his shoes without notifying health physics. Again on June 25, 1980, a worker left the hand and foot monitor after it alarmed and washed his hands three times (used hand and foot monitor after each washing) before notifying health physics. The inspector stated that failure of the workers to immediately notify Health Physics when they found their hands contaminated was another example of failure to follow procedure as required by Technical Specification 6.8.1 (321/80-27-16).

Plant Procedure HNP-8005 requires that material and equipment be given an unconditional release by health physics personnel for use outside the boundary of the RCA if no smearable contamination is found and radiation levels are less than 0.1 mr/hr using the E-140 survey instrument. On June 24, 1980, a worker was observed taking a bag of tools out of the RCA without a survey by HP. When the worker was questioned concerning a survey of the tools, he returned to the HP office and had the tools properly surveyed. The inspector stated that failure of the worker to have the tools surveyed prior to taking them outside the boundary of the RCA was another example of failure to follow procedure as required by Technical Specification 6.8.1 (321/80-27-16).

An inspector checked the detectors in the hand and foot monitors at the exit from the RCA using a 11,000 dpm Tc-99 source. The monitor failed to alarm on any detector. A licensee representative stated that the plant used a Sr-90 source to check each detector. The inspector stated that the detectors should be calibrated and/or response checked with a source that was representative of the type of contamination found in the plant (principal isotopes in the contamination is Co-60 and Co-58). The inspector stated that the hand and foot monitor did not appear to be set with sufficient sensitivity to detect contamination on a person at or slightly above the release limit of 1,000 dpm/100 cm^2. The inspector stated that the licensee should evaluate the monitoring devices being used to determine that individuals are not contaminated above the release limit and ensure that they are meeting the plant's needs (321/80-27-21).

Thirty-one personnel contamination cases were documented in 1979 and nine cases in 1980. Based on the observations of the inspectors, this appears to be an underestimation of the actual number of individuals contaminated. Discussions with a number of licensee representatives (HP staff and other plant employees) lead the inspectors to conclude that contaminations of the facility and personnel has become an accepted way of life at the plant. Licensee management stated that they were dedicated to keeping the plant radiologically clean and that housekeeping was a high priority item at the plant.

The inspector observed three health physics technicians performing a smear survey on the 158' elevation of the Unit 1 reactor building on June 18, 1980. The entrance to the area being surveyed was posted with a "contaminated area" sign. The sign stated that shoe covers and gloves were required for entry. The technicians were not wearing any protective clothing. When questioned by the inspector, the technicians stated that the area had been cleaned on a previous survey and they were just verifying the survey results. The inspector stated that entering posted areas without complying with the protective clothing requirements provides a poor example for the plant workers. The inspector ask to see the survey results that lead to the clearance of the 158' elevation. A licensee representative stated that the HP log indicated the survey was performed at 1420 on June 18, 1980, however the radiation survey record for the survey was not completed. The inspector ask to see the results of the survey taken by the 3 technicians at approximately 3:30 p.m. June 18, 1980 on the 158' elevation. The inspector was informed that this survey was not documented. Contamination surveys performed later on June 18, 1980, indicated that the 158' elevation was generally contaminated. The inspector stated that, the frequency and scope of contamination surveys performed when contamination is found in normally uncontaminated areas should be evaluated. The inspector stated that failure of the technicians to complete a radiation survey record as required by plant procedure HNP-8012 was another example of failure to follow procedure as required by Technical Specification 6.8.1 (321/80-27-16). The inspector stated that the licensee should promptly perform an evaluation of the plant's contamination control program, since there is a real potential for plant employees to leave the plant contaminated above the plant's release limits.

(4) Temporary Shielding

While touring the plant on June 18, 1980 the inspectors observed that temporary lead shielding had been installed on several plant components, including a 3-inch residual heat removal (RHR) line located in the northeast diagonal of the reactor building and loop "B" of the spent fuel pool cooling system located on the 185' elevation of the reactor building. A review performed by

the licensee, determined that the RHR line was the only part of a safety-related system that had temporary shielding installed. 10CFR50.59 permits the holder of a licensee authorizing operation of a production or utilization facility to make changes to the facility as described in the safety analysis report, without prior Commission approval, unless the proposed change involves a change in the technical specifications incorporated in the license or an unreviewed safety question. The licensee is required by 10CFR50.59 to maintain records of changes in the facility which shall include a written safety evaluation which provides the basis for the determination that the change does not involve un reviewed safety question. From discussions with licensee representatives, the inspectors found that a safety analysis had not been performed prior to installation of the temporary lead shielding on the RHR piping. The inspectors also found that the licensee had no procedures or criteria for the placement of temporary shielding including placement on safety-related piping and components. The licensee promptly removed the lead shielding from the RHR piping when the need for a safety analysis was brought up by the inspector. The inspector stated that a procedure should be prepared which included (1) an assessment of the static and dynamic loading, particularily on safety-related systems, that will result from the installation of temporary shielding, (2) criteria as to when the use of temporary shielding would be considered from a health physics standpoint, and (3) a surveillance program for installed temporary shielding. The inspector stated that failure to perform a safety evaluation prior to the installation of temporary lead shielding on safety-related piping is noncompliance (321/80-27-22) with 10CFR50.59.

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

(1) quality control program for periodically checking the accuracy of the internal monitoring systems (Paragraph 8.b).

(2) periodic evaluations, with documented results, of the respiratory protection program (Paragraph 8.b).

(3) determination of flow rate of low volume air samples (Paragraph 8.b).

(4) contamination control program (Paragraph 8.b(3).

(5) personnel monitoring for contamination (Paragraph 8.c(3).

(6) documentation of radiological survey results (Paragraph 8.c(3).

(7) control of temporary shielding (Paragraph 8.c.(4).

9. Radioactive Waste Management

An inspector reviewed selected liquid and gaseous waste release permits for 1980. The releases appeared to meet the requirements of the Technical Specifications.

The licensee has recently assigned a shift supervisor to the position of radwaste supervisor. In discussions with the radwaste supervisor, he stated that the plant had begun to take actions to reduce the amount of radioactive waste generated. Specifically, the station has begun keeping the plant's demineralizers in service longer, to minimize the number of resin changes and thus the solid waste generated. The plant is also studying the purchase of a new solid waste compactor which would permit the packaging of twice the amount of solid waste per drum.

Although the responsibilities of the radwaste supervisor has not been formally established, the individual assigned supervises the operators that work in the area of radioactive waste processing, including solid waste packaging, resin dewatering, etc. The inspector stated that in addition to the other responsibilities the plant should consider making the radwaste supervisor responsible for scheduling the shipment of solid waste off-site to the burial facility. This would relieve the laboratory supervisor (health Physics) of this time consuming task in order to permit him to spend more time working on the in-plant radiation protection problems (321/80-27-23).

The inspectors observed the licensee loading solid radioactive waste (Compacted waste and spent resin) on trucks for shipment to the burial facility, reviewed the shipping papers and performed independent radiation surveys of the trucks after loading. The shipments appeared to meet NRC and DOT regulations and the burial facility criteria for burial.

The inspector stated that the licensee needs to increase the awareness of each individual to the necessity for reducing the amount of radioactive waste generated. This could best be accomplished by making this a part of the general employee training program (321/80-27-24).

During the review of the plant procedures concerning radioactive waste shipments, the inspector noted that plant procedure HNP-8016 still calls for the technician to determine the dose rate in the driver's seat rather than surveying the entire cab, even though earlier in 1980 a noncompliance item resulted from failure to insure that the dose rate in normally occupied section of the cab was less than 2 mrem/hr. A licensee representative stated that the procedure would be changed to ensure that the technician has the proper instructions for performing the survey (321/80-27-25).

An inspector reviewed the results of the following in-place test of the charcoal adsorbers in the ventilation exhaust of Unit 2:

Refueling floor exhaust (2T41-D007 and 2T41-D008)

Turbine building exhaust (2V41-D004 and 2V41-D005)

The test appeared to have been performed in accordance with acceptable testing procedures.

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

10. ALARA Program

a. 10 CFR 20.1c states that persons engaged in activities under licenses issued by the NRC should make every reasonable effort to maintain radiation exposure as low as is reasonably achievable (ALARA). The recommended elements of an ALARA program are contained in Regulatory Guide 8.8, Information Relevant to Ensuring That Occupational Radiation Exposure at Nuclear Power Stations will be ALARA, and Regulatory Guide 8.10, Operating Philosophy for Maintaining Occupational Radiation Exposures ALARA. From discussions with licensee representatives and observations of actual work practices, the inspector found that many elements of an ALARA program did exist at the plant. Specific examples such as the feed water nozzle modifications performed on Unit 1 during the last refueling could be found where actions were taken which contributed to keeping the exposure ALARA. However, the inspectors observed several instances where little consideration for keeping exposure ALARA was evident. For example, the airborne contamination problems in the Unit 1 radwaste control room and the general contamination in Unit 1. This instance are discussed in detail in Section 8.c.

b. During a discussion of station procedures with licensee representatives, the representative 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 radioactively 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 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 (321/80-27-26).

c. There are no formal or informational post-operational briefings held. Exposure data from past jobs is available for use. There was no evidence that any information gained from past experience was used to increase job performance in regard to ALARA.

d. Regulatory Guide 8.10, Paragraph C states that management of the licensed facility should be committed to maintaining exposures ALARA and that plant personnel should be made aware of the commitment. The

inspector stated that the licensee should consider formally adopting an ALARA program at the station with individuals qualified to give the engineering and health physics support specifically assigned (321/80-27-27).

e. Summary: Based on the above findings the following matters should be considered for improvement of the program:

(1) formally adopt an ALARA program with specifically assigned personnel.

(2) establish a review of all plant procedures by radiation protection personnel

11. Facilities and Equipment

a. Facilities

Near the HP Operations Control Center a control point has been established to limit access to the turbine and reactor buildings. This access point has a showers and sink (with hot drain), restroom, a "frisker", and a hand and shoe monitor. The access control point can easily be viewed from the HP office therefore, this is a well located control point.

Change areas are located near the entrance to the administrative and work shop areas, however they are not convenient to the control point. This is a building design deficiency, the problem has been improved by locating change areas near specific work areas.

Equipment can be decontaminated at the HP access control point. Near the HP control point is the respirator wash and decontamination area.

Radiation material storage is located at one end of the turbine building near the shipping exit. Drums of waste were found roped off and arranged according to content. Temporary storage of low-level wastes was at strategic points throughout the plant.

The only HP office in the radiation control area is located adjacent to the HP Operations Control Center. Although this space is conveniently located, it is small and inadequate for HP staff. Additional work space is needed for supervisory and technical personnel.

Although limited facilities for laundrying contaminated clothing are available at the plant, these services are normally provided by a contractor either on-site or at an off-site facility.

There is a counting room in which the whole body counter and all counting equipment is located. This room is relatively small and is also used as a waiting room by persons needing whole body counts. Occassionally hot samples are brought near the counting equipment, which leads to erroneous positive whole body counts. High radio-

activity due to noble gases in the reactor building has on occasion caused high airborne radioactivity in the counting room . The high traffic problem, the potential for contamination and airborne problems are routine problems and could render the counting room ineffective during an emergency situation. The inspector stated that the whole body counter be moved to a more suitable location, (i.e. service building) inspector also stated that the ventilation system should be reevaluated and modified, as necessary, to prevent the loss of the counting room in the event of high airborne radioactivity in other areas of the plant (321/80-27-28).

Calibration Facility

The space available for instrument calibration and repair is very limited. The personnel using the calibration facility are well versed in its use and are doing a commendable job in view of the physical constraints. Access to the facility is under lock and key. Alarms are in place during use and inadvertent entrance is not possible. Source are kept in locked storage with the keys maintained by health physics. Source inventory was found to be complete, and accurate copies of all calibration procedures were readily available within the facility. The inspector recommended that the plant obtain a copy of ANSI Standard N323-1978 and operated the calibration program in accordance with the guidance in that document. This document will provide information that will improve the quality of the instrument calibration program. An Plutonium-Beryllium neutron source is available for use in calibrating and response checking neutron survey instruments. In discussions of the calibration facility with licensee representatives the inspector was informed that considerations was being given to obtaining better facilities for the calibration and repair of radiation survey instruments.

b. Equipment

(1) Protective Clothing

Various sizes of protective clothing, are readily available for use in the dressout areas in the reactor building. These dressing areas are moved to accomodate the needs of the workers and job.

(2) Laboratory Instrumentation

The counting equipment was inventoried and found adequate, with one exception. There was no capability for in-house counting of tritium samples. As a matter of good practice and as suggested in Regulatory Guide 8.8, a liquid scintillation counter should be obtained (321/80-27-29). The equipment available is calibrated at a predetermined frequency and routinely checked to verify that the instrument was still in calibration.

(3) Portable Instrumentation

The inspectors observed a variety of health physics instruments and equipment (portable survey instruments, portal monitors, personnel friskers, air samplers) in use, observed the calibration of instruments, checked calibration stickers, performed battery checks for selected portable instruments, and selectively examined calibration records for survey instruments in use. An inspector discussed the radiation survey instrument calibration program with the health physics technicians who repairs and calibrate the instruments and with technicians who use the instruments as well as licensee management.

The plant has an adequate number of portable health physics of instruments for routine operations and probably has sufficient instruments for handling off-normal and emergency situations.

Emergency instruments are stored at several locations through out the plant and at off-site locations. These instruments are calibrated at the same frequency as instruments in routine use.

The station uses a Cs-137 source, which is relatable to a National Standard, for calibrating portable gamma survey instruments. An inspector reviewed the calibration procedures and observed health physics personnel calibrating various instruments.

Routine maintenance problems are handled by the health physics technicians who calibrate portable instrumentation. More complicated problems are referred to the instrument manufacturers. A tickler file contains records of maintenance, calibrations, and the date of the next required calibration. Instruments are calibrated after all repairs. The laboratory foreman (health physics) reviews these files on a regular basis.

During tours of the plant, the inspectors questioned the health physics technicians on the principles of detection and operation of radiation survey instruments. Although the technicians were knowledgable in the use of the instruments, some needed more thorough understanding of the principles of radiation detection and limitation in the use of each survey instrument.

c. Summary: 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:

Isolation of the counting room from potential source of airborne radioactivity in the plant (Paragraph 4.a).

12. Emergency Response Capabilities

A separate NRC evaluation effort is being conducted regarding nuclear reactor emergency planning activities. The emergency planning evaluation for Plant Hatch was conducted April 21-25, 1980 (Report No. 50-321/366/80-19) by a regionally-based emergency planning team. In light of this fact, the health physics appraisal team will refrain from specific evaluations of the licensee's emergency response capabilities except to the extent that conduct of this routine health physics program impacts on the licensee's capability to respond to accident situations.

An inspector observed a licensee representative performing an inventory of emergency health physics equipment and supplies located at the Plant's Technical support center and in a small trailer which can be moved by security department vehicles. The following deficiencies were noted:

a. High voltage, window setting, threshold and efficiency were determined 11/29/79, and posted on the MS-2 SPA-3 instrument located in the technical support center. However, these values were not determined to still be correct after the instrument was recalibrated 3/24/80.

b. TLDs are kept with each supply of instruments, however, no TLD are designated as controls, nor do the kit include a method of recording who receives each TLD.

c. There are no operating procedures for the AM-3 constant air monitor located in the technical support center.

d. An eight microcurie Cs-137 source, used for response checking portable survey instruments, is stored unshielded in the emergency kits along with TLD to be issued. This could result in individual's being assigned doses they didn't receive.

e. No instructions are provided in the kits on how to use the Cs-137 check source (how each instrument should respond, geometry, etc.).

13. Licensee Action on Previous Inspector Identified Items

(Closed) Open Item (321/79-12-05; 366/79-16-05) Relocation of CTS transfer pumps. The licensee has installed a concrete wall completely enclosing the CST pumps. The inspector had no further questions.

(Closed) Open Item (321/79-12-06; 366/79-16-06) Sampling additional wells for tritium. The additional samples were taken and analyzed. The inspector had no further questions.

(Closed) Open Item (321/79-34-04; 366/79-38-04) Review of chemistry/health physics training. The licensee has issued Plant Procedure HNP-207 which describes the periodic retraining to be received by technicians. The inspector reviewed this procedure and had no further questions.

(Closed) Open Item (321/79-34-07; 366/79-38-07) Training of technicians on radioactive material shipping regulations. The training required by IE Bulletin 79-19 has been completed. The inspector has no further questions.