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

REGION V

Report Nos. 50-528/84-31, 50-529/84-25, 50-530/84-17

Docket Nos. 50-528, 50-529, 50-530

License Nos. CPPR-141, 142, 143

Licensee: Arizona Public Service Company
P. O. Box 21666
Phoenix, Arizona 85836

Facility Name: Palo Verde Nuclear Generating Station Units 1, 2 and 3

Inspection at: Palo Verde Site - Wintersburg, Arizona

Inspection conducted: August 6-10, 1984

Inspectors: H S North — 8/24/84
H. S. North, Senior Radiation Specialist — Date Signed

Approved by: G P Yuhas — 8/24/84
G. P. Yuhas, Chief — Date Signed
Reactor Radiation Protection Section

Summary:

Inspection August 6-10, 1984 (Report Nos. 50-528/84-31, 50-529/84-25 and 50-530/84-17)

Areas Inspected: Routine, unannounced inspection of chemistry and radiation protection organization, staffing, qualifications, retraining and replacement training, followup items, preoperational testing, followup on information notices, CRACS, ALARA, sampling, procedures and facility tours.

The inspection involved 39 hours onsite by one inspector.

Results: In the 12 areas inspected, no violations or deviations were identified.

DETAILS

1. Persons Contacted

*D. Karner - Assistant Vice President - Nuclear Production
*T. Bloom - Licensing Engineer
*L. Brown - Radiation Protection and Chemistry Manager
+*B. Cederquist - Chemical Services Manager
P. Egebrecht - Radiation Protection Engineer
T. Green - Supervisor Training Support
*K. Gross - Compliance Supervisor
+*F. Hicks - Training Supervisor
+*G. Irick - QS&E Engineer
M. Lantz - Radiation Protection Support Supervisor
*D. Nichols - General Training Supervisor
K. Oberdorf - Unit 1 Radiation Protection Supervisor
J. Ong - Radiation Protection Engineer
+*C. Russo - Manager Quality Audits/Monitoring
*J. Schlag - Acting Radioactive Materials Control Manager
J. Scott - Unit 3 Chemistry Supervisor
+*R. Selman - ALARA Supervisor
+ J. Smith, Jr. - Compliance Engineer
T. Warren - Unit 1 Chemistry Supervisor
I. Zeringue - Manager Technical Support

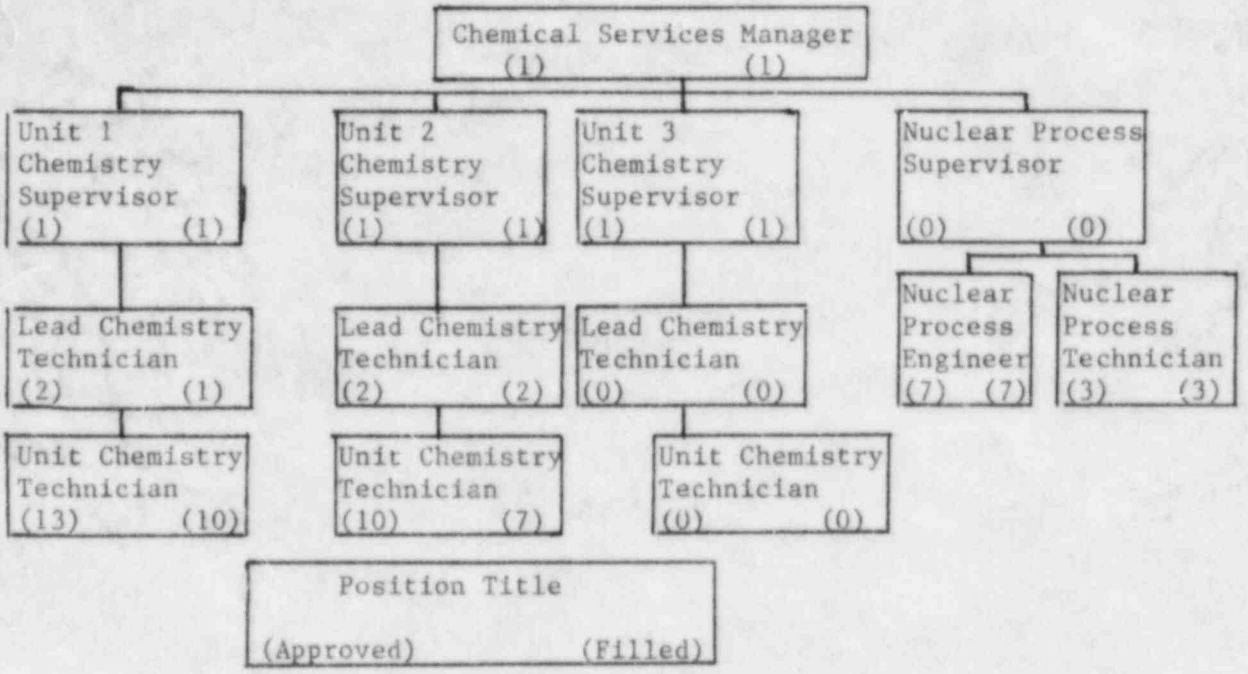
In addition the inspector interviewed other APS and contractor technician and professional staff members.

(+) Denotes attendance at the entrance interview on August 6, 1984.
(*) Denotes attendance at the exit interview on August 10, 1984.

2. Organization and Staffing

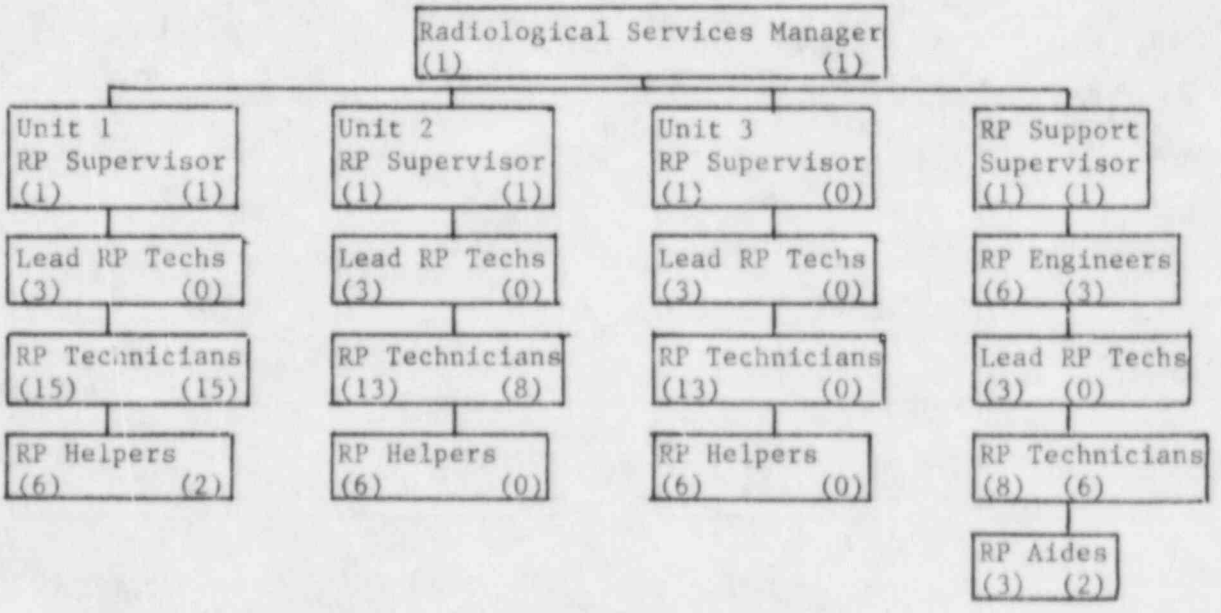
The licensee had approved a reorganization of the chemistry, radiation protection and radwaste organization. The Chemistry and Radiation Protection Manager (CRPM) reports to the Manager Technical Support who reports to the Director Nuclear Operations. Reporting to the CRPM are the Managers of Radiological Services (RSM), Chemical Services (CSM), Rad. Materials Control (RMCM) and the ALARA Supervisor.

The designation of the RSM and CSM as managers represents a title change from Amendment 12 of the FSAR (Sections 13.1.2.2.2.2.1 and 13.1.2.2.2.2.2) which identifies these positions as the Radiation Protection Supervisor and Chemistry Supervisor respectively.

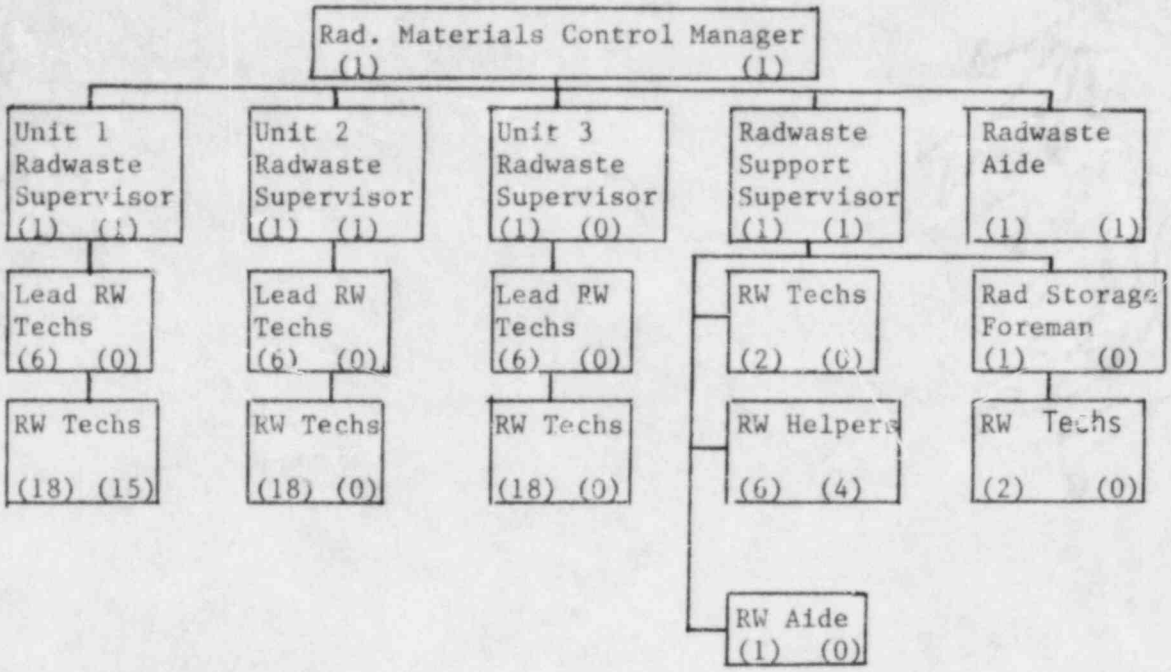


The chemistry manning level exceeds that identified in FSAR Figure 13.1-7, Manning Schedule.

The Water Reclaimation Facility (WRF) chemistry staff reports to the CSM. The licensee reported that 14 positions are filled and 5 unfilled.



Radiation Protection staffing exceeds that identified in Amendment 12 to FSAR Figure 13.1-7.



The ALARA staff consists of the ALARA Supervisor reporting to the Chemistry and RP Manager and two ALARA Engineers with one vacancy.

The present Chemistry and RP staffing budget of 214 allocates manpower as follows:

	Manager	Chemistry	RP	Radwaste	ALARA
Unit 1		16	20	13	
Unit 2		16	20	13	
Unit 3		16	20	13	
WRF		19			
Support		10	19	9	3
Admin.	1	1	2	2	1
Total	1	78	81	50	4

The budget does not include contractor support for peak work periods.

The licensee had formalized the Chemistry and R.P. organization (83-03-01, closed).

No violations or deviations were identified.

2. Training

A Retraining and Replacement Training program for chemistry, radiation protection, ALARA and radwaste workers was being implemented. A total of 13 contractor instructors, including 9 in the identified specialty areas, had been authorized for temporary support of the program. Several different contractors may be used in obtaining support for this program. The training organization had also received authorization for 9 APS

training staff positions of which 6 were to be in the identified specialty areas.

Training schedules for chemistry and RP had been developed through December 1985. A contractor prepared specialized training program for radwaste personnel, based on a needs analysis, was approximately 85-90% complete. When fully implemented the retraining and replacement training program will provide approximately 140-160 student contact hours per year at an instructor teaching load of approximately 40%.

The chemistry training began on August 6, 1984. The schedule identified the following topics to be addressed during 1984.

Radiochemistry
PASS
Laboratory Analytical Control
Systems Chemistry and Control
Technical Specifications
Sampling
Fundamental Chemistry
Analytical Chemistry
Laboratory Instrumentation
Laboratory Safety
System Instrumentation
Accident/Abnormal Chemistry
PASS OJT Hands On

The identified courses are scheduled to be repeated twice during 1985. Training aids, e.g. view graphs, and instructors guides are in preparation. In some cases these materials may not be available in time for the first classroom presentation. In these cases the course will be taught from the text. The chemistry staff is nearing completion of the texts for the various classes. In the preparation of the material the chemistry staff is drawing on a total of 219 man years of nuclear experience. Of the total, 147 man years has been at nuclear utilities in the following categories:

PWR preoperational	-	73 man years;
BWR preoperational	-	25 man years;
PWR operational	-	29 man years;
BWR operational	-	20 man years.

Technicians attending the first series of classes are those identified by chemistry department management as exhibiting training weaknesses. In 1985 the courses will be repeated in survey form for all technicians. Class size is limited to 10 technicians. Classes are held 8 hours per day. In addition seminars on specific topics, e.g. Industry Problems, Chemistry Related LER's and Plant Problems, are planned.

The radiation protection training schedule identified the following topics:

1984

Site Area Familiarization (in support of off site monitoring)
Dose Assessment (emergency plan)
Statistics/Interaction
REP Generation
Bio Effects/Projection
RP Standards/Regulations
Detection/Instrumentation/Dosimetry
10 CFR 61

1985

Airborne
Radiation Monitoring System
Equipment Operation/Laboratory Technique
Fuel Loading
Decon Control
Mitigating Core Damage
Assessment/E-Plan
Job Coverage
Exposure/ALARA
Procedures
Radioactivity/Communications
Problem Reports
Communications Skills
Equipment

Seminars will be planned on a quarterly basis with the Radiation Protection Department. During the preoperational phase special attention will be devoted to effluent monitoring including documentation, discharges and Technical Specification Bases. A short review course, approximately 40 hours on radiation protection basics is planned for all ANSI qualified radiation protection technicians. This course will include DOP, instrumentation angular dependence and portable instruments used on site.

The Radwaste course is to consist of 15 four hour training modules including classroom and systems walkdown and qualification manual verification. Training will include laundry facility operation, shipping, handling, 10 CFR 61, basic electrical, mechanical and I&C and response to radwaste control room alarms in support of the operating responsibilities of the radwaste staff. Academic fundamentals and radiation protection training will be provided based on need identified through testing.

All groups chemistry, radiation protection and radwaste will receive training in power plant systems, mitigating core damage and tagging procedures.

The ALARA training planned includes completion of makeup training for technicians, decon and station services personnel in decon, HEPA filter changes, and possibly a repeat of the hot shop training using fluorescent powder to provide practical demonstration of contamination control.

Approximately 80% of supervisors and foremen had completed an NUS ALARA training program. Contractor provided ALARA training for engineering disciplines was being evaluated. The training is to include the use of the System 80 model, Section 12 of the FSAR, ALARA evaluation of design packages, exercise in ALARA techniques, a plant tour and examples of ALARA lessons learned.

A 4 to 8 hour ALARA presentation for management is to include NRC's position re ALARA, ANI experience on exposure litigation and cost benefit analysis.

The licensee is presently constructing a mock up for steam generator maintenance training.

With respect to the licensee's failure to implement a retraining and replacement training program, such a program had been or was being implemented with respect to chemistry, radiation protection, radwaste and ALARA (closed, 50-528/84-13-01).

No violations or deviations were identified.

3. Followup on Previously Identified Items

(Closed, 50-528/83-12-05) The inspector verified that the licensee had received the quantity of friskers specified in FSAR Section 12.5.2.2.3.

(Closed, 50-528/83-12-08) The inspector verified that the licensee had the capability to provide TLD personnel monitoring. No significant technical problems remain in the communication of TLD dose information to the REM computer system.

(Open, 50-528/83-12-20) As reported in Inspection Report No. 50-528/83-12 Section 11.e. Backup Laboratory Facilities, the licensee had proposed the use of the Arizona State University (ASU) as a backup facility for analysis of PASS samples. The licensee subsequently proposed the use of the Palo Verde Unit 2 laboratory as a PASS sample backup laboratory in place of ASU. The licensee was informed during the inspection that if the Unit 2 was to be used in this capacity the laboratory would need to be fully operational with respect to the proposed analyses. In addition appropriate ventilation, shielding, effluent monitoring and provisions for waste handling would be required.

(Closed, 50-528/83-35-02) The licensee had included training of escorts in radiation protection responsibilities in the Site Access and RWP training programs.

(Open, 50-528/83-39-03) The licensee had onsite a Squire-Cogswell Company, trailer mounted, electrically operated, breathing air (grade E) compressor, with a 60 cfm capability. A high pressure reserve air supply is provided in the event of compressor failure.

(Closed, 50-528/84-05-01) The licensee's plans for personnel neutron monitoring were reviewed. Licensee procedures permit either calculation of exposure based on dose rates measured with a calibrated Eberline PNR-4

or the use of neutron dosimeters. The licensee was evaluating bids for operational neutron monitoring from commercial vendors as well as continuing evaluation of the use of the APS Panasonic TLD system.

APS neutron TLD's were recently exposed to mixed gamma and neutron doses at the Oak Ridge Health Physics Research Reactor as part of the 10th Personnel Dosimetry Intercomparison Study (PDIS). The neutron TLD's exposed during the 1984 PDIS were evaluated based on calibration factors established from the 1982 test. All gamma exposure measurements were found to be within 10% of the delivered dose. With the exception of two runs, the neutron measured exposures were within 11% of the delivered dose. The two runs excluded involved TLD's with 137 Cs gamma enhanced gamma to neutron ratios of 10 and 20, where the neutron exposures had been shielded with lucite and concrete respectively. The licensee reported that for neutron dosimetry if the calibration factor were known doses could be determined within 10%. If the 9" to 3" sphere ratios were known doses could be determined within 30-40% and with no knowledge of the neutron spectrum within a factor of 2 or 3.

Based on these discussions it appeared that adequate provisions for neutron monitoring will be available by fuel load.

(Closed, 50-528/84-05-02) The inspector verified that procedures 73AC-0ZZ12, Plant Change Request (PCR), Rev. 2, 5/25/84 and 73AC-0ZZ15, Plant Change Package (PCP), Rev. 1, 6/25/84 had been revised to provide for appropriate ALARA review.

(Closed, 50-528/84-13-02) The licensee had validated the dose conversion factors of all nuclides listed in the ODCM, verified that two different computer systems provided the same results and documented the validity of all factors included in the computer program which is to be used to support procedure, 75RP-9ZZ92 Gaseous Radioactive Effluent Release Permits and Offsite Dose Assessment. The program had been found to be compatible with the ODCM. The licensee plans a repetition of the hand calculation of offsite dose by another individual as a final check. The procedure had been revised to reflect minor program changes and was under review.

(Open, 50-528/84-13-04) Control of access to the spent fuel tube bellows had been achieved by locking the chain fall used to remove shield plugs. Keys were in the custody of the Shift Supervisor and the Unit 1 Radiation Protection Supervisor. Administrative controls imposed on control of keys will be examined during a subsequent inspection.

No violations or deviations were identified.

4. Preoperational Testing

The status of preoperational tests selected for review was examined. In the case where a preoperational test had been completed, approved and accepted, test results were examined to assure that the test results were within the previously established acceptance criteria and, where applicable, deviations from acceptance criteria were properly identified

and disposed in accordance with the licensee's procedures. The following completed test package was examined:

91PE-1LR04 - Chemical Drain Tanks and Pumps

No violations or deviations were identified.

5. Followup on IE Information Notices

Receipt, review for applicability and action if appropriate of the following IE Information Notices for Docket Nos. 50-528, 50-529 and 50-530 was verified during the inspection.

No. 84-15 Reporting of Radiological Releases (IN-84-15, Closed)
No. 84-22 Deficiency in Comsip, Inc. Standard Bed Catalyst

No violations or deviations were identified.

6. Chemistry Department Personnel Qualifications

Based on discussions with licensee personnel and examination of licensee records the inspector concurred with the licensee's evaluation of the ANSI 3.1 qualification status of chemistry technicians. The licensee had determined that 19 out of 20 technicians were ANSI qualified. The nuclear experience of the chemistry staff was:

	Total Staff Number	Total Number including Navy Years	Utility Not Operating Years	Utility Operating Years
Unit 1	11	78.2	32	13.5
Unit 2	9	90	33	27

The status of completion of the qualification program for the technician staff:

Primary	18%
Secondary	35%
Systems	48%
PASS	0%
Overall	25%

No PASS completion status is to be included until the third PASS training, due August 20-24, 1984, has been completed. PASS hands on training is scheduled for November-December 1984 due to required modifications of the PASS. At the time of the inspection the qualification completion rate was approximately 16 weeks.

No violations or deviations were identified.

7. Chemical and Radiological Analysis Computer System (CRACS)

The licensee stated that the CRACS had been received onsite. Due to operational problems the licensee plans to place no reliance on the

system at this time. An examination of the FSAR, Lessons Learned Implementation Report (LLIR) and SER disclosed no commitments which referenced CRACS or were CRACS dependent. The PVNGS Emergency Plan refers to CRACS on pages 6-9, 6-26, 7-44 and 9-5.

With respect to the chemistry and radiation protection program the licensee has provided alternate means to satisfy the functions which CRACS was to provide. Planned CRACS dependent functions and the alternate capabilities developed are noted below:

Dose calculation, normal and accident conditions - Manual calculation using microcomputer;

Body burden dose calculation with automatic entry of dose in REM System - Chair counter not operational, when operational has a stand alone capability. An operational vendor supplied whole body counter is onsite. Whole body count data will be entered in REM system manually;

Access control job TLD and record TLD analysis, dose calculation and entry in REM system - TLD system problems resolved using IBM microcomputer with data entry in REM system;

Multichannel analyses capability, isotopic identification and quantification - Multichannel analyzers both normal operations and PASS have stand alone capability;

Automatic recording of Radiation Monitoring System readouts - Manual record maintenance;

Meteorological data collection, reduction and joint frequency distribution calculation for Reg. Guide 1.21 reports - Manual reduction of meteorological system records and report preparation by a contractor;

Gaseous radioactive effluent permit generation and offsite dose calculation - An alternate capability has been developed, see Report Section 3, item 50-528/84-13-02.

No violations or deviations were identified.

8. ALARA

Inspection Report No. 50-528/84-05 and 50-529/84-05 identified the licensee's plans to use photographs to minimize exposure time spent in locating valves and other components. The ALARA group evaluated the use of photographs, survey maps showing valve and component positions and the use of high visibility component labels. Personnel preferred the use of maps over photographs. Testing established that a factor of 10 reduction in time resulted from the use of maps and high visibility tags vs. the absence of such aids. The ALARA group plans to retain the photographs on file for the use of personnel requiring more detailed information on the location of equipment.

The ALARA groups review of design changes was essentially complete through the July 1983 time period. Approximately 125 of the remaining 400-500 design changes had been reviewed.

The ALARA group had been following up on corrective actions either by direct observation or through Bechtel or the start up engineering organization.

No violations or deviations were identified.

9. Sampling

Procedures related to the collection of samples were examined. 74OP-1SS01, Rev. 0, 10/25/83, Nuclear Sampling Instructions and 74OP-1SC02, Secondary Sampling Instructions, Rev. 0, 8/29/83 were examined. The procedures specify purge times and flow rates to assure the collection of a valid sample. Purge times and flow rates were calculated on the basis of piping size and length. Ability to deliver required purge flow rates will be verified by examination of completed preop test results when the results are available (50-528/84-31-01, Open).

The licensee had developed a cart mounted particulate, iodine and gas grab sampler designed for use with or in place of process monitors. The device provides for measuring and controlling gas flow through the sample media to assure isokenicity. The sampler was fully self contained including a pump and 50 foot power cord. A total of 6 such samplers are planned for Unit 1.

No violations or deviations were identified.

10. Procedures

Certain reviewed and approved procedures were examined for implementation of and compatibility with the FSAR and NRC regulations.

74OP-1SS01, Rev. 0, 10/25/83, Nuclear Sampling Instructions;

74OP-1SC02, Rev. 0, 8/29/83, Secondary Sampling Instructions;

73AC-0ZZ12, Rev. 2, 5/25/84, Plant Change Request;

73AC-0ZZ15, Rev. 1, 6/25/84, Plant Change Package;

74ST-1HF01, Rev. 0, 6/16/83, Fuel Building Essential Ventilation System Surveillance Test; and

75PR-0ZZ01, Rev. 2, 1/13/84, Radiation Protection Program.

No violations or deviations were identified.

11. Facility Tour

During the inspection the laundry/decon facility, calibration facility, radwaste and portions of the auxiliary building were toured.

No violations or deviations were identified.

12. Exit Interview

The scope and results of the inspection were discussed with the individuals denoted in paragraph 1 at the conclusion of the inspection. The licensee was informed that no violations or deviations were identified. The inspector commented favorably on the licensee's actions with respect to the three items called to management's attention during the inspection conducted April 9-13, 1984 (Inspection Report No. 50-528/84-13 and 50-529/84-10).