U. S. NUCLEAR REGULATORY COMMISSION
REGION V

Report Nos. 50-528/88-41, 50-529/88-40 and 50-530/88-39

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

License Nos. NPF-41, NPF-51, NPF-74

Licensee: Arizona Nuclear Power Project
P. O. Box 52034
Phoenix, AZ. 85072-2034

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

Inspection Conducted: November 6 through December 16, 1988

Inspectors: W-P. Ang for Miller for Polich — 1-11-89
T. Polich, Senior Resident Inspector — Date Signed

W-P. Ang for Miller for Coe — 1-11-89
D. Coe, Resident Inspector — Date Signed

W-P. Ang for Fiorelli for Miller — 1-11-89
G. Fiorelli, Resident Inspector — Date Signed

W-P. Ang for Crews — 1-11-89
J. Crews, Senior Reactor Engineer (November 28 - December 1, 1988) — Date Signed

Approved By: W-P. Ang for Miller — 1-11-89
L. F. Miller, Chief
Reactor Projects Section 2 — Date Signed

Inspection Summary:

Inspection on November 6, through December 16, 1988 (Report Nos. 50-528/88-41, 50-529/88-40 and 50-530/88-39)

Areas Inspected: Routine, onsite, regular and backshift inspection by the three resident inspectors and the Regional Senior Reactor Engineer. Areas inspected included: previously identified items; review of plant activities; engineered safety feature system walkdowns; monthly surveillance testing; monthly plant maintenance; preventive maintenance program; startup testing - Unit 3; preparations for refueling - Unit 3; quality assurance reviews; design/engineering technical reviews; review of licensee event reports; review of periodic and special reports; and review of the following situations: control element slippage during testing - Unit 1, reactor trip on low steam generator level - Unit 2, leaking air supply to fuel pool inflatable seals - Unit 2, seepage path of RCS leakage water through concrete wall inside containment - Unit 2, RU-141/PASP excessive sample media moisture - Units 2 and 3, and unqualified Rosemont transmitter electrical connectors - Unit 3.

During this inspection the following Inspection Procedures were utilized: 30703, 60705, 61726, 62703, 71707, 71710, 92702, 92701, 90713, 93702, 40500

Safety Issues Management System (SIMS) Items: None

Results: Of the 19 areas inspected, no violations were identified.

General Conclusions and Specific Findings

A Unit 1 licensed operator was observed in a relaxed position and appeared not to be attentive to plant operations. While this appeared to be an isolated occurrence, it reflected acceptance of poor watchstanding by the individual and the shift (see Section 3.d).

Sunflower seed shells, a candy wrapper and a cigarette butt were observed in a Radiological Controlled Area (RCA) at Unit 3 (see Section 14). This is evidence that some workers did not observe fundamental radiological controls at Unit 3 (Inspection Report 50-530/88-10 reported a similar earlier event).

Prior to Control Element Assembly (CEA) testing a Unit 1 Shift Supervisor conducted a crew briefing that included anticipated problems and potential Technical Specification Limiting Conditions for Operation (LCO) that may have been encountered (see Section 8). As a result, when CEAs slipped, the crew was able to readily recovery them.

Significant Safety Matters: None

Summary of Violations: None

Summary of Deviations: None

Open Items Summary; 10 items closed, 2 items left open, and 2 new items opened.

DETAILS

1. Persons Contacted:

The below listed technical and supervisory personnel were among those contacted:

Arizona Nuclear Power Project (ANPP)

R. Adney,	Manager, Plant Standards and Control
*J. Allen,	Plant Manager, Unit 1
P. Brandjes,	Manager, Central Maintenance
F. Buckingham,	Operations Manager, Unit 2
R. Butler,	Director, Standards and Technical Support
C. Churchman,	Manager, Work Control, Unit 3
J. Dennis,	Manager, Work Control, Unit 1
W. Fernow,	Manager, Training
*R. Ferro,	Manager, Chemistry, Unit 2
D. Fowler,	Manager, Quality Systems and Engineering
R. Gouge,	Operations Manager, Unit 3
*J. Haynes,	Vice President, Nuclear Production/Site Director
*W. Ide,	Plant Manager, Unit 2
D. Karner,	Executive Vice President, ANPP Administration
*J. Kirby,	Director, Nuclear Production Support
*J. LoCicero,	Manager, Independent Safety Engineering
A. McCabe,	Maintenance Manager, Unit 1
*J. Minnicks,	Maintenance Manager, Unit 3
K. Oberdorf,	Manager, Radiation Protection, Unit 1
A. Ogurek,	Manager, Radiation Protection, Unit 2
L. Papworth,	Director, Quality Assurance
*D. Phillips,	Manager, Maintenance, Unit 2
W. Quinn,	Director, Nuclear Safety & Licensing
*J. Scott,	Manager, Work Control, Unit 2
*T. Shriver,	Manager, Compliance
*L. Souza,	Manager, Quality Audits & Monitoring
G. Sowers,	Manager, Engineering Evaluations
D. Stover,	Acting Manager, Nuclear Safety
J. Tench,	Director, Site Services/Manager, Material Control
R. Younger,	Operations Manager, Unit 1
*O. Zeringue,	Plant Manager, Unit 3

The inspectors also talked with other licensee and contractor personnel during the course of the inspection.

*Attended the Exit meeting held with NRC Resident Inspectors on December 16, 1988.

2. Previously Identified Items - Units 1, 2, and 3 (92702, 92701)

a. (Open) Enforcement Item (529/88-07-02): "Review of Modification Inadequate".

The licensee forwarded the Quality Systems and Engineering (QS&E) audit of Engineering Evaluation Request (EER's) to the Nuclear Engineering Department for review. At the end of the reporting period, this review was not complete. The review was part of the licensee's commitment for corrective action, and this item will remain open until the review is complete.

b. (Closed) Enforcement Item (529/88-07-03): "Inadequate Retest".

The inspector found during this report period that the licensee was properly certifying retests for work orders generated after the issuance of the "Retest" procedure, 30AC-9WP04. This item is closed.

c. (Closed) Enforcement Items (529/88-18-01 and 530/88-18-01): "Cooling Water System Chemical Addition Tanks Found Unisolated - Units 1 and 3".

These violations resulted from mispositioned chemical addition tank isolation valves for the safety grade Essential Chilled Water (Unit 3) and Essential Cooling Water (Unit 1) systems, which were identified by the inspector on June 13 and 14, 1988. Periodic spot checks since that time and a check of all such valves in all three units on November 29, 1988, failed to identify any further discrepancies. This item is closed.

d. (Closed) Followup Item (528/88-01-11): "Design Basis Document Ambiguities - Unit 1".

The licensee has taken several actions to resolve ambiguities related to design basis documents. These included the development of procedure 91P-ES01.00 "Configuration Management" which specified which documents are design basis documents and discussed elements of the program.

Additionally training on configuration management has been provided for the nuclear engineering staff as part of the licensee's Engineering Excellence Program. This item is closed.

e. (Closed) Followup Item (528/88-01-14): "Reporting of Plant Deficiencies".

The licensee implemented a program which provided visible indication that work requests have been issued for equipment requiring corrective maintenance. Procedure 30DP9WP01, "Work Identification," required a "Maintenance Required Tag" on equipment needing corrective maintenance. The inspector observed numerous tags on equipment while on tours of the three units. This item is closed.

f. (Closed) Followup Item (528/88-01-23): "Manual Valve Preventive Maintenance and Surveillance".

The inspector confirmed that a preventive maintenance (PM) program for manual valves had been drafted by the licensee. The program identified 60 manual valves which could have an accident mitigation function. The preventative maintenance tasks associated with these valves included inspection, cleaning, lubricating, and stroking. The program was receiving final review and was to be implemented in January 1989. Inspection of program implementation will be completed as a normal NRC inspection function. This item is closed.

g. (Closed) Followup Item (528/88-01-29): "System Engineer Program Improvements".

Several meetings between NRC and ANPP management were held during which this topic was discussed. Reviews by regional management were also conducted as a followup to this item. A System Engineering Program manual describing the program was noted to have been developed by the licensee.

Implementation of the licensee's program elements will be followed as a part of the normal inspection program. This item is closed.

h. (Closed) Followup Item (528/88-32-01): "Fire in Radwaste Building - Unit 1".

Following a small fire in a high radiation area caused by welder's sparks, the licensee's Nuclear Construction (NC) Department completed a more thorough investigation into this event than was originally conducted by the Fire Protection Department. This second investigation made specific recommendations for revising the Hot Work Authorization permit and the Conduct of Maintenance procedures. In addition, recommendations were made for additional review of the necessity for welding operations when planned within radiation

areas, and improvement of Control Room response to fires. The inspector concluded that the Fire Protection Department's original assessment of this event had been inadequate in that it did not provide detailed recommendations within a scope of review broad enough to identify all causal factors or to develop all lessons learned. The inspector noted that the Fire Protection Department apparently did not have the capability to perform comprehensive assessments of fire related events. However, the inspector concluded that the second investigation had been adequate. The licensee was encouraged to consider how future fire protection related events would be investigated. The licensee acknowledged the inspector's comments. This item is closed.

i. (Closed) Unresolved Item (528/88-01-17): "Improper 10 CFR 50.59 Review of Essential Chiller Oil Temperature Change".

This item refers to an Engineering Evaluation Report which authorized the starting of essential chillers with sump oil temperatures as low as 130 degrees F instead of the vendor's nominal recommendation of 140 degrees F. A 10 CFR 50.59 evaluation done in connection with this change had previously concluded that there was no increase in the probability of a malfunction of equipment important to safety. This conclusion was questioned by the inspector.

The inspector verified that on April 20, 1988, the licensee had communicated with the chiller vendor requesting confirmation that starting the chillers at a low limit oil temperature of 130 degrees F versus 140 degrees F would not result in an increased probability that the chiller would trip from a low oil pressure. The vendor stated there was no reason for concern provided the proper relationship of oil temperature and percentage of refrigerant in oil were maintained. A set of technical curves was provided to the licensee for his use. Based on discussions with the system engineer, the inspector was informed that the original 10 CFR 50.59 review was still considered valid by the licensee and did not require a change. This item is closed.

j. (Closed) Unresolved Item (528/88-01-28): "Adequacy of Technical Transfer Program Improvement Plans".

Several meetings between NRC and ANPP management were held during which this topic was discussed. An Engineering Excellence Manual outlining the licensee's actions related to this matter was noted to have been developed by the licensee. Implementation of the licensee's program for technology transfer will be followed as part of the normal inspection program. This item is closed.

3. Review of Plant Activities (71707, 71710, & 93702)

a. Unit 1

Unit 1 operated at 100% power for most of the period. Reactor power was lowered to 80% for a short period of time to conduct control element and control element assembly calculator testing.

b. Unit 2

Unit 2 operated at 100% power from the start of the inspection period until November 15, 1988 when a power reduction was begun to investigate and repair a Reactor Coolant System (RCS) leak. On November 16, 1988 a reactor trip resulted from Low Steam Generator Level due to problems with the Feedwater Control System (FWCS) during automatic swapover. Paragraph 9 provides further details of this event. The unit was taken to Mode 4 on November 17, to repair an instrument isolation valve which was found to be the source of the RCS leak. On November 23, 1988 the unit was taken critical and after reaching 100% power remained at that power to the end of the report period.

c. Unit 3

Unit 3 operated at 100% power for most of the period.

d. Plant Tours

The following plant areas at Units 1, 2 and 3 were toured by the inspector during the course of the inspection:

- Auxiliary Building
- Containment Building
- Control Complex Building
- Diesel Generator Building
- Radwaste Building
- Technical Support Center
- Turbine Building
- Yard Area and Perimeter

During an inspection of Unit 1 control room activities on November 5, 1988, the inspector observed, upon entry into the control room, a licensed operator sitting in a chair normally used by the assistant shift supervisor. Based on his extremely relaxed posture it appeared to the inspector that the individual was not attentive to plant operations. The inspector also noted that two licensed operators and the assistant shift supervisor were positioned inside the horse-shoe area of the control room. The inspector informed a licensee manager who took immediate corrective action to prevent similar behavior in the future.

The following areas were observed during the tours:

1. Operating Logs and Records Records were reviewed against Technical Specification and administrative control procedure requirements.

The inspector noted a Unit 1 log entry on December 7, 1988, related to the automatic termination of a planned gas release from the "A" waste gas decay tank. Radiation monitor RU12 which monitored the activity of the gases being released initiated a closure signal to two isolation valves in the discharge line. The licensee concluded from a review of the matter that the closure signal was anomalous as the activity of the released gas was well below the monitor setpoint. Resampling of the gas and a recheck of the calculations and monitor setpoint revealed no problems.

The inspector reviewed the licensee's evaluation report and concluded no unplanned release had occurred.

2. Monitoring Instrumentation Process instruments were observed for correlation between channels and for conformance with Technical Specification requirements.

3. Shift Manning Control room and shift manning were observed for conformance with 10 CFR 50.54.(k), Technical Specifications, and administrative procedures.

4. Equipment Lineups Various valves and electrical breakers were verified to be in the position or condition required by Technical Specifications and administrative procedures for the applicable plant mode. This verification included routine control board indication reviews and the conduct of partial system lineups.

5. Equipment Tagging Selected equipment, for which tagging requests had been initiated, was observed to verify that tags were in place and the equipment was in the condition specified.

6. General Plant Equipment Conditions Plant equipment was observed for indications of system leakage, improper lubrication, or other conditions that would prevent the systems from fulfilling their functional requirements.

7. Fire Protection Fire fighting equipment and controls were observed for conformance with Technical Specifications and administrative procedures.

8. Plant Chemistry Chemical analysis results were reviewed for conformance with Technical Specifications and administrative control procedures.

9. Security Activities observed for conformance with regulatory requirements, implementation of the site security plan, and administrative procedures included vehicle and personnel access, and protected and vital area integrity.

10. Plant Housekeeping Plant conditions and material/equipment storage were observed to determine the general state of cleanliness and housekeeping. Housekeeping in the radiologically controlled areas was evaluated with respect to controlling the spread of surface and airborne contamination.

11. Radiation Protection Controls Areas observed included control point operation, records of licensee's surveys within the radiological controlled areas, posting of radiation and high radiation areas, compliance with Radiation Exposure Permits, personnel monitoring devices being properly worn, and personnel frisking practices.

No violations of NRC requirements or deviations were identified.

4. Engineered Safety Feature System Walkdowns - Units 1, 2 and 3 (71710)

a. Selected engineered safety feature systems (and systems important to safety) were walked down by the inspector to confirm that the systems were aligned in accordance with plant procedures. During the walkdown of the systems, items such as hangers, supports, electrical cabinets and cables, were inspected to determine that they were operable, and in a condition to perform their required functions.

b. Accessible portions of the following systems were walked down during this inspection period.

Unit 1

- o "B" Train Essential Chilled Water
- o Containment Spray Chemical Addition (Iodine Removal)
- o "A" Train Emergency Diesel Generator

Unit 2

- o "B" Train Essential Chilled Water
- o Class 1E 4160V and 480V Electrical Distribution
- o "A" Train Emergency Diesel Generator

Unit 3

- o "B" Train Essential Chilled Water
- o Class 1E 4160V and 480V Electrical Distribution
- o Containment Spray Chemical Addition (Iodine Removal)
- o "A" Train Emergency Diesel Generator

No violations of NRC requirements or deviations were identified.

5. Monthly Surveillance Testing - Units 1, 2 and 3 (61726)

a. Surveillance tests required to be performed by the Technical Specifications (TS) were reviewed on a sampling basis to verify that: 1) the surveillance tests were correctly included on the facility schedule; 2) a technically adequate procedure existed for performance of the surveillance tests; 3) the surveillance tests had been performed at the frequency specified in the TS; and 4) test results satisfied acceptance criteria or were properly dispositioned.

b. Portions of the following surveillances were observed by the inspector during this inspection period:

Unit 1

Procedure	Description
o 73ST-1ZZ10	Section XI Valve Stroke Timing (Feed Water Isolation and Main Steam Isolation Valves)
o 32ST-9ZZ03	Class 4160 Bus Under Voltage Protective Relays
o 43ST-3SI03	Containment Spray Pump Operability

Unit 2

Procedure	Description
o 73ST-2ZZ09	ASME Section XI Valve Stroke Timing
o 73ST-9CL04	Containment Airlock Overall Leak Test
o 72ST-9SB02	CPC/CEAC Auto Restart Check

Unit 3

Procedure	Description
o 73ST-3ZZ10	ASME Section XI Valve Stroke Timing (FWIV)
o 73ST-9CL06	Containment Ventilation Purge Isolation Valve Leak Test

No violations of NRC requirements or deviations were identified.

6. Monthly Plant Maintenance - Units 1, 2 and 3 (62703)

a. During the inspection period, the inspector observed and reviewed documentation associated with maintenance and problem investigation activities to verify compliance with regulatory requirements, compliance with administrative and maintenance procedures, required QA/QC involvement, proper use of safety tags, proper equipment alignment and use of jumpers, personnel qualifications, and proper retesting. The inspector verified that reportability for these activities was correct.

b. The inspector witnessed portions of the following maintenance activities:

Unit 1

Description

o Electric Motor Air Filter Cleaning - "B" Train Auxiliary Feedwater Pump

o Condenser Air Removal Pump - "D"

Unit 2

Description

o Troubleshoot and Repair Uninterruptible Power Supply for Emergency Lighting

o Repair of Packing Leak of Channel A Plant Protective System Root Valve

Unit 3

Description

o Replace Mechanical Seal - "A" Train Containment Spray Pump

o Set Miniflow Recirculation Throttle Valve - "A" Train Containment Spray Pump

o Repack Letdown Back Pressure Control Valve CHE-PV-201Q

o Obtain Voltage Readings on Channel "D" Excore Detectors

c. Work Group Supervisor Signature Block Missing From Work Order Attachment - Unit 3 (62703)

While reviewing licensee Work Order 258904 to repair letdown backpressure control valve 3CHE-PV-201Q, the inspector noted that the Instrument and Controls (I and C) Work Group Supervisor (WGS) reviewed an attachment to the work order instructions and identified a necessary change. The

inspector noted that no signature block existed for the WGS to document this required review on the work order attachment. The licensee's procedure "Work Planning," 30DP-9WP02, required the same level of review and signature documentation for this work order attachment as was given the original work order. The inspector pointed out to licensee management that work planning practices apparently did not provide full assurance that this requirement would be met. In addition, the inspector questioned the effectiveness of a technical review of the attachment by a "Discipline Supervisor" which preceded the WGS review and failed to identify the needed changes.

Licensee management responded to these concerns by initiating an investigation which seeks to identify why work planning practices failed to provide a method for documenting the WGS review on attachments to work orders requiring this review, and to determine why the first technical review of the attachment failed to identify the need for changes. The results of the licensee's assessment will be reviewed upon completion (Unresolved item 530/88-39-01).

No violations or deviations of NRC requirements were identified.

7. Preventive Maintenance Program - Units 1, 2 and 3 (62703)

The inspector discussed the plant Preventive Maintenance (PM) Program with several unit maintenance and technical support managers. The inspector determined that a procedure describing the preventive maintenance program had been developed. The inspector was informed that work identification, work frequency determination, program revisions and program coordination were the responsibility of the Standards and Technical Support organization. The responsibility for scheduling PMs and conducting the work rested with the work control and maintenance groups respectively. The inspector formed the impression that the PM program was viewed by the ANPP staff as an important program and the individuals interviewed considered its implementation to have a direct bearing on equipment operability and reliability. The inspectors noted that a monthly report which is issued to management includes statistics covering the amount of PM work completed as well as the number overdue. The inspectors also noted that no formal accounting or reporting of waived PMs existed. The program permitted the waiving of PMs, however this action required specific approvals depending on the safety significance of the work. The absence of a performance indicator on waived PMs was discussed with ANPP management. It was pointed out that while individual Unit Managers exercised some control of this option, a broader awareness of this action by other plant management was important from an independence standpoint, as the waiving of PMs could be a self serving action. Management stated that it would review this matter.

No violations of NRC requirements or deviations were identified.

8. Control Element Assembly (CEA) Slippage During Testing - Unit 1 (71707)

On December 16, 1988, CEA exercising had commenced per 41ST-1SF01, "CEA Operability Checks". The first CEA to be exercised was CEA 64 due to previous slippage problems which have been encountered. The CEA was moved from 147.5 inches out to 150 inches and then inserted to 144 inches with no problems. When CEA 64 was withdrawn from 144 inches it slipped to 138.37 inches. The Shift Supervisor had anticipated such problems and had briefed the crew on the evolution and the possible Technical Specification Limiting Conditions for Operations (LCO). Since CEA 64 was greater than 6.6 inches misaligned from its group LCO 3.0.3 was entered due to non-compliance with LCO 3.3.1 Action Requirement 6.b.3. Simultaneously Actions 3.1.3.5 and 3.1.3.1.c were entered and the Core Operating Limit Supervisory System (COLSS) was declared inoperable.

At 11:00 a.m., while attempting to withdraw CEA 64 in compliance with the Technical Specifications, it slipped to 121.79 inches. CEA 57 (a regulating group 1 CEA) was noted to also have slipped to 105.7 inches at the same time. Due to the second CEA being misaligned by greater than 19 inches Action 3.1.3.1.b was entered. Seven minutes later CEA 57 was restored to within 6.6 inches of its group and Action 3.1.3.1.b was exited. A power reduction from 85% power began at 11:09 a.m. in compliance with Action 3.1.3.1.c. At 11:21 a.m., with CEA 57 placed on the hold bus, CEA 64 slipped to a minimum of 61 inches and then began to withdraw. CEA 64 was restored to 148 inches at 11:26 a.m. and Actions 3.0.3, 3.1.3.1.c and 3.1.3.5 were exited. The COLSS was declared operable at 11:30 a.m. and one minute later the power reduction was stopped with power at 80%.

The licensee's preliminary evaluation of the CEA 57 slippage problem suggested it was caused by a ground on the lower gripper coil of CEA 64 which lowered the CEA bus voltage and caused CEA 57 to slip. After reactor engineering's evaluation of the CEA 64 and 57 slippage, CEA exercising was resumed and at 4:06 p.m. 41ST-1SF01 was completed satisfactorily.

The inspector concluded the licensee's actions taken to anticipate the problems of the slipped CEA and the subsequent recovery to be appropriate. None of the CEAs have exhibited failure to insert and therefore do not present a stuck CEA potential. The licensee has initiated a Technical Specification change to exempt CEA 64 from monthly exercising for the remainder of Cycle 2 (approximately 3 months). The licensee's Technical Specification Amendment request will be reviewed by NRR.

No violations of NRC requirements or deviations were identified.

9. Reactor Trip on Low Steam Generator Level - Unit 2 (93702)

On November 15, 1988, Unit 2 commenced a power reduction at 8:00 p.m. to investigate and repair a Reactor Coolant System (RCS) leak.

At 2:33 a.m. on November 16, 1988, reactor power had been reduced to approximately 15% and the Feedwater Control System (FWCS) swapover occurred as designed. This automatic swapover closes both steam generator economizer regulating valves; opens both steam generator downcomer valves; reduces the Main Feedwater Pump (MFWP) speed to approximately 3759 rpm; and changes the FWCS from three element to single element (level) control.

When the swapover occurred both steam generator levels began to decrease; however, the FWCS did not respond as expected to mitigate the level decrease. With decreasing steam generator level the heat removal capability of the secondary system was reduced resulting in an increasing RCS temperature and higher steam generator pressure. The steam generator pressure increased until the Steam Bypass Control System (SBCS) began modulating to mitigate the heatup. Concurrently the Primary Operator inserted Control Element Assemblies (CEAs) to reduce RCS temperature. Steam generator levels continued to decrease until the Steam Generator Low Level Pre-Trips were received and a reactor trip on steam generator low level occurred at 2:37 AM. The Control Room Supervisor diagnosed the reactor trip as uncomplicated and the control room staff utilized 42RO-2ZZ01 "Reactor Trip", to stabilize the plant.

The licensee subsequently performed post-trip review report 2-88-001 and identified the following concerns:

- The Feedwater Control System response was not sufficient in "Automatic" to prevent a reactor trip on low steam generator level following the economizer/downcomer swapover during the power reduction.

- The feedwater flow indications following the reactor trip appeared to be inaccurate.

- The steam flow indications for both steam generators were erratic and did not correspond with expected conditions for this event.

- Several performance concerns became apparent during the investigation of the transient. Control room operators did not utilize all available instruments in diagnosing the inadequate feedwater flow to the steam generators.

- Technical review of a previous modification, which lowered the minimum feed pump speed setting, did not adequately evaluate effects of minimum speed reduction on FWCS operation at low power levels.

The inspector found the scope of the above concerns to be thorough and noted the following corrective actions were completed prior to startup of Unit 2:

- Plant Shutdown, Plant Startup and MFWP Operations procedures were revised to give guidance to ensure proper MFWP discharge pressure is maintained during various evolutions.
- MFWP "A" Speed Control Program was recalibrated.
- Both steam flow transmitters were replaced.
- No. 2 steam generator total feed flow transmitter was recalibrated.
- Engineering Evaluation Request 88-SF-046 was initiated to track troubleshooting of the FWCS.

The additional corrective actions which were scheduled for completion within the next 90 days included:

- Review of event lessons learned in Licensed Operator Requalification Training.
- Completion of a Human Performance Evaluation of the event.
- Evaluate operation of the FWCS over the entire range of operation and initiate design changes deemed necessary.
- Evaluate Site Mod Procedure, System Engineer Program and current departmental interface responsibilities to determine if a similar event can be prevented in the future.
- Perform a cross-discipline review on a representative sample of current Site Mods.

These corrective actions will be reviewed as part of the Licensee Event Report close out of this event.

No violations of NRC requirements or deviations were identified.

10. Leaking Air Supply to Fuel Pool Door Inflatable Seals - Unit 2 (71707)

During a walkdown of the Unit 2 Fuel Building the inspector noted the sound of leaking pressurized air in the vicinity of air hoses supplying pressure from nearby wall-mounted air supply valves to the inflatable seals on two separate doors. One of the doors provided a barrier between the spent fuel pool and a spent fuel cask loading area which was flooded with water. The other door provided a barrier between the cask loading area and the cask washdown area, which is open to the fuel building and not designed to be flooded. Zone three housekeeping boundaries were set at the time and the inspector was unable to get close enough to pinpoint the source of the leakage. Subsequent to the inspector's inquiries, the licensee identified the source of the leakage to be at the quick disconnect fittings at the air supply valve and additionally at the point of penetration of the air supply tubing into the rubberized portion of

the inflatable seal for the door separating the two flooded cavities. If a complete failure of the air supply were to occur to this seal, the seal would deflate and allow a leakage path between the spent fuel pool and the cask loading cavity. Since the cask loading cavity was flooded, there would have been no significant effect on the level of the spent fuel pool, which contained spent fuel from Cycle One.

However, the inspector made the following observations:

- o The air supply hoses lying on the floor and the use of quick disconnect type fittings increased the risk that the air supply to these seals could be inadvertently reduced or cutoff. Although a check valve at the seal air connection was intended to prevent deflation upon loss of air supply, the problem reported here indicated the possibility of seal failure downsteam of the check valve. An identical air leak occurred previously in Unit 1.

- o This deficiency was similar to the one reported in NRC Information Notice 88-92 "Potential For Spent Fuel Pool Draindown" issued November 23, 1988. The event described in the Notice involved the near failure of a single seal having a potential for spent fuel pool draindown. The two Unit 2 seals discussed here would have to fail simultaneously in order to drain the spent fuel pool. This air leakage was not investigated by Auxiliary Operators, RP Technicians, and others making tours through the area even though some had reported the leaking hose. The inspector concluded that the Unit 2 operations staff had not aggressively followed up on the Information Notice.

In response to these concerns, licensee management stated that site modification 2SM-IA-008 was being installed in Unit 2 and would replace the air supply hoses and fittings with permanent piping. In addition, licensee management stated that a discussion of the potential consequences of fuel pool draindown would he held during regularly scheduled training for Unit 2 operators and technicians. The inspector emphasized the importance of aggressively identifying and pursuing all anomalies to final resolution.

In addition, the inspector encouraged the licensee to complete the site modification in all three units, noting that Units 1 and 3 will begin refueling activities prior to Unit 2. The licensee acknowledged these comments.

No violations of NRC requirements or deviations were identified.

11. Seepage Path of RCS Leakage Water Through Concrete Wall Inside Containment - Unit 2. (71707)

During the Unit 2 outage to repair a broken steam generator flow instrument isolation valve, the licensee determined that RCS leakage from this valve had accumulated into a standing puddle of water on

the floor of the 100 foot elevation near the 1B Reactor Coolant Pump cubicle. The licensee further determined that this standing water seeped through minute cracks in the adjacent concrete wall, entered the incore instrument (IC) chase and ran down the wall into the reactor cavity sump drain, where it provided an early indication of the RCS leak. The licensee could not identify a defect in the concrete wall which provided the entry point for water seepage. However, the NRC inspector accompanied a licensee on-site engineer on an inspection of the seepage exit points within accessible areas of the IC chase.

The licensee determined that the minute cracks through which the seepage propagated were probably caused by mass volume changes resulting from temperature gradients within the highly restrained walls. This was considered a normal condition. The licensee's analysis of the effects of this seepage considered the corrosion rate induced upon the reinforcing steel by the borated water solution and determined that such corrosion would not significantly affect the strength or design function of the wall.

The inspector reviewed Engineering Evaluation Request (EER) 88-ZC-075 which documented the licensee's analysis and noted that it had been appropriately reviewed and approved by the licensee's Engineering Department. In addition, a copy of the EER was forwarded to NRC regional management for assessment of the need for further technical review. The inspector considered the licensee's actions in this matter to be appropriate.

No violations of NRC requirements or deviations were identified.

12. RU-141/PASP Excessive Sample Media Moisture - Units 2 and 3. (71707)

Activity monitors RU-141 and RU-142 are the condenser off-gas low and high range monitors, respectively. On December 5, 1988 Unit 3 declared RU-141/142 inoperable due to excessive moisture in the charcoal (iodine) and particulate filters. The possibility of iodine and particulate activity becoming entrained in the moisture and affecting the reliability of the monitor's reading formed the basis for this decision. The licensee considered that recent cold weather may have caused the condensation of airborne moisture on the filter media. Since this problem also affected the sample cart which is part of the Planned Alternate Sampling Program (PASP) required to be initiated when RU-141/142 is inoperable, the licensee was unable to meet the Technical Specification 3.3.3.8 action statements which require the PASP under these conditions. Additionally, the licensee determined that they could not continuously assess their compliance with the offsite dose limits required by Technical Specification 3.11.2.1. As compensatory measures the licensee increased monitoring of secondary activity and installed a temporary modification to the sampling lines which provided a thermal blanket to warm the sample air to approximately 150 degrees F. In addition, the licensee informed the inspector that a correlation was determined between reactor coolant and steam generator activity and condenser off-gas discharge activity which showed that off-gas activity was well within the dose limits of

Technical Specification LCO 3.11.2.1. Thus, isotopic measurements of reactor coolant and steam generator activity could be used temporarily in lieu of actual off-gas monitoring to assure compliance. Following installation of the thermal blankets, RU-141/142 was again declared operable in Unit 3 on December 14, 1988. This item will be followed up by regional Radiation Protection inspectors.

Unit 2 noted a similar problem during this time and took similar compensatory measures. Monitors RU-141/142 were already considered inoperable in Unit 2, however, due to an unrelated electrical problem. Unit 1 personnel determined a similar problem did not exist at that unit (Followup Item 50-530/88-39-02).

13. Unqualified Rosemont Transmitter Electrical Connectors - Unit 3 (71707)

On December 1, 1988, during an entry into the Unit 3 containment to work on pressure transmitter PT 105 a technician observed that the electrical connector attached to that transmitter as well as to PT 106 was not of the same design as the environmentally qualified connector required by the drawings.

The transmitters were purchased from the Rosemont Company and served to provide an interlock close signal to hot leg shutdown cooling valves UV 653 and UV 654 when reactor coolant pressure exceeds 700 psig and a permissive open signal when primary coolant pressure falls below 400 psig.

A licensee inspection of the connectors confirmed that the connectors did not contain the required seal to prevent moisture intrusion into the electronic portion of the transmitter. Both connectors were replaced with properly designed units. At the time the connectors were suspected to be environmentally unqualified, a justification for continued operation was evaluated and documented. The evaluation concluded that Technical Specification equipment operability requirements were not violated.

The licensee is currently reviewing the circumstances associated with the installation of the wrong connectors which were installed during the construction phase.

The inspector followed closely the licensee's evaluation and correction of the problem. Based on discussions with the licensee's staff and a review of documents and photographs the inspector concluded that the licensee confirmed that properly qualified connectors had ultimately been installed. Licensee assessment of other Rosemont transmitter electrical connectors did not identify any similar problems at the three units.

No violations of NRC requirements or deviations were identified.

14. Food Debris and Cigarettes in a Radiologically Controlled Area - Unit 3 (71707)

On November 24, 1988, the inspector found a cigarette butt, a candy wrapper and sunflower seed shells on I-beams in pipe chase A-C03 on the 51 foot elevation of the Unit 3 Auxiliary Building, a Radiologically Controlled Area (RCA). Further investigation revealed sunflower seed shells on the 40 foot elevation directly below the I-beam. Scaffolding had been erected in the pipe chase on November 23, 1988, for work on the containment spray system.

The inspector reported the finding to the Radiation Protection Technician Supervisor who immediately dispatched a Radiation Protection Technician who cleaned up the area. The Radiation Protection Technician made a log entry concerning these findings.

The licensee has not been able to identify the person or persons responsible for the cigarette or food. The inspector advised licensee management that this incident appeared to be an example of unsound radiological control practices by some workers at ANPP.

No violations of NRC requirements or deviations were identified.

15. Startup Testing - Unit 3

In response to a request by NRR, the inspector confirmed that Unit 3 startup tests 93PE-3SA01, "Integrated Test of Engineered Safety Features" ("A" Train only) and 92PE-3SB17, "Safety Systems Response Time Test" had been performed and that the test results had been reviewed and approved by the licensee. The "B" Train portion of 93PE-3SA01 was completed and approved using a similar test procedure 73ST-3DG02, "Class 1E Diesel Generator and Integrated Safeguards Surveillance Test - Train "B" after the Unit 3 license was issued. This change occurred because extensive repairs of the "B" diesel were required after the engine failed during its initial test operation. These confirmations were reported to NRR.

No violations of NRC requirements or deviations were identified.

16. Preparations for Refueling - Unit 3 (60705)

Unit 3 is scheduled to begin its first refueling outage in March 1989. This inspection was initiated by the inspector's attendance at the bi-weekly outage planning meeting led by the Unit 3 work control manager on December 7, 1988. The inspector noted that the meeting proceeded in a direct and efficient manner and reviewed the status of numerous details, including parts procurement, new fuel receipt, design change packages and site modifications to be installed, various organizational responsibilities, and planned training in radiation protection and outage management systems. The meeting was attended by approximately 15 supervisors and the plant manager. Attendance was sufficient to allow direct assignment of followup responsibility. A review of the licensee's refueling procedures and administrative requirements will be reported in a subsequent inspection report.

No violations of NRC requirements or deviations were identified.

17. Quality Assurance (QA) Reviews (40500)

The inspector examined certain activities performed by Quality Systems and Engineering to assess the degree of contribution to overall quality at Palo Verde. Among other activities, this group performs in-line review and approval of several quality documents and sampling reviews on a smaller subset, such as Temporary Modifications, Calculations and Changes, Engineering Evaluation Requests, and Engineering Studies. The group summarizes the results of their activities in a monthly report to the management of those organizations producing the documents reviewed. ANPP has defined a measure of performance (Quality Assurance Performance Ratio) and a minimum level of acceptability for this ratio (0.95). The monthly reports of these ratios are included in quarterly and semiannual reports of Quality Assurance assessments results to senior management.

The inspector found that certain documents reviewed by QS&E had a trend of very low compliance ratios; such as Site Modifications Packages, Specifications and Specification Change Notices, Single Line Drawings, and Field Change Requests. These facts were included in the Monthly Report, but less clearly reflected in the Quarterly and Semiannual reports. Therefore, the inspector concluded that specific areas requiring improvement needed to be more clearly highlighted to Senior Management for their corrective action.

Based upon the in-line review and approval function of QS&E, the inspector agreed that specific deficiencies were being corrected prior to issuance to the field; however, poor performance trends were not being identified by means of corrective action requests (CARs), to the organizations performing poorly. Further, since the individual statistics were not clearly presented in the quarterly and semiannual reports, the poor performance in specific areas was not clearly being brought to the attention of Senior Management.

Licensee representatives acknowledged these system weaknesses and noted that future review activities were planned to be of a sampling nature and, therefore, subject to corrective action demands.

The licensee's QA representatives also recognized that audits, monitoring, and document reviews were excessively oriented toward compliance and programmatic aspects. However, the licensee has initiated actions, by way of QA/QC improvement plans, to provide an increased orientation toward performance based inspections.

The licensee's QA organization performs a semiannual trending analysis of CARs and Monitoring reports. However, the trend information was not broken down to a level of detail such that particular activities of particular organizations demonstrating poor trends were clearly identified for corrective action to Senior and Organizational Management. The trending program is in need of serious reassessment and definition to assure that organizations

responsible for poor performance in a particular area are clearly put on notice for improvement.

The inspector noted that the QA Improvement plan was currently under development, and was anticipated by the licensee, to correct the above problems.

No violations of NRC requirements or deviations were identified.

18. Design/Engineering Technical Reviews (40500)

The inspector determined that in the past, the Quality Assurance (QA) organization had conducted audits, monitoring and review activities aimed principally at determining compliance with procedural and programmatic requirements, as opposed to assessing the technical adequacy and effectiveness of work activities within ANPP.

Discussions with QA management, supervisory and engineer/inspector representatives during the current inspection period revealed evidence of a deliberate effort by QA management to shift the focus of QA activities toward an increasing emphasis on technical adequacy and effectiveness. The Design and Procurement Unit within the Quality Systems and Engineering (QS&E) Department was conducting "In-Line" reviews of selected design/engineering documents, including design change packages (DCP) generated by the Nuclear Engineering Department. In-line reviews were also performed for all site modifications. The In-line review process, which involves signature/approval by the QS&E Department prior to issuance of the document, had until recently (approximately the past two months, according to licensee representatives), concentrated principally on assuring compliance with procedural aspects of the design/engineering work.

In an effort to assess the effectiveness of the recent shift in focus by QA toward increased emphasis on the technical adequacy of work activities, the governing QA procedure for conduct of reviews of designing/engineering documents (Procedure No. QA01.00.02, Revision 0, dated January 15, 1988) was examined, and discussion relating thereto were held with licensee representatives involved in the conduct of reviews of design/engineering documents. The following findings resulted.

There were presently five individuals, including the Unit Supervisor, and four QA engineers within the Design and Procurement Unit who conducted reviews of design/engineering documents. Each of these individuals had B.S. degrees in engineering or science. Engineering disciplines included Electrical, Civil, Structural, and Nuclear Engineering. A review of biographical data and discussions with licensee representatives revealed that the prior work experience of these individuals had been principally in the areas of quality and test engineering.

The facility records showed that Procedure No. QA 01.00.02 included a Design/Engineering Technical Review Checksheet, Revision 1, dated October 21, 1988, used to facilitate the conduct of In-Line and sampling reviews of design/engineering documents. This checklist was observed to be exceptionally comprehensive in terms of the attributes to be examined in the review of documents, including verification of FSAR conformance for the system subject to design change or modification; verification of conformance to system/component design criteria, design basis, and installation specifications; and examination of the completeness and accuracy of calculations.

The inspectors examined a sample of checklists for two calculations and three Engineering Evaluation Reports completed during the past month and found them to reflect a substantive review of the documents to which they were associated. In two instances, for example, the checklists had attached to them independent calculations performed by the QA Engineer in verifying the adequacy of calculations included in the design document reviewed.

No violations of NRC requirements or deviations were identified.

19. Review of Licensee Event Reports - Units 1, 2 and 3 (90712, 92700)

Unit 1

LER NUMBER	DESCRIPTION
88-02-LO	Nonconservative Setpoints on Hi Log Power Trip.

This report discussed the setting of the high log power trips contrary to the allowable values in the Technical Specifications following startup from the first Unit 1 refueling outage. The immediate corrective action taken by the licensee was the insertion of correct setpoints. Calorimetric compensation has been performed at Unit 3 to optimize the log power indication. This is also planned for Unit 1 prior to its next refueling outage. A supplemental report which will discuss longer range corrective actions is to be issued by the licensee. This LER remains open pending submittal of the supplement.

88-14-LO Main Steam Safety Valve Setpoint Out of Tolerance.

This report discussed the ASME Surveillance Test conducted on the main steam safety valves, which indicated seventeen of the twenty valve relief settings were out of the tolerance limits specified in Technical Specifications. The licensee concluded that the safety valves were still capable of performing the intended function of ensuring steam generator pressure remained within 110% of design pressure. The valve setpoints were corrected and the valves were retested successfully. In addition, the valves will be retested prior to the next unit refueling outage. This LER is closed.

88-16-LO Reactor Trip Following Early Criticality

This report discussed a reactor trip which occurred as the control element assemblies were being inserted following an attempt to startup the reactor.

The investigative findings related to this event were documented in NRC Inspection Report 528/88-20. The licensee corrective actions included several procedural changes reflecting the lessons learned from the event. In addition, several engineering actions such as including CEA worth curves below 60 inches in the core data book and modifying the computer program which calculates transient xenon levels were completed. A human performance evaluation was also performed. The inspector concluded that the corrective actions taken by the licensee were appropriate. This LER is closed.

No violations of NRC requirements or deviations were identified.

20. Review of Periodic and Special Reports - Units 1, 2 and 3 (90713)

Periodic and special reports submitted by the licensee pursuant to Technical Specifications 6.9.1 and 6.9.2 were reviewed by the inspector.

This review included the following considerations: the report contained the information required to be reported by NRC requirements; test results and/or supporting information were consistent with design predictions and performance specifications; and the validity of the reported information. Within the scope of the above, the following reports were reviewed by the inspector.

Unit 1
o Monthly Operating Report for October, 1988.

Unit 2
o Monthly Operating Report for October, 1988.

Unit 3
o Monthly Operating Report for October, 1988.

No violations of NRC requirements or deviations were identified.

21. Exit Meeting

The inspector met with licensee management representatives periodically during the inspection and held an exit on December 16, 1988. During the exit meeting, the inspector emphasized the importance of fully assessing and documenting radiation effluent monitor automatic actions from the perspective of a possible unplanned release, and ensuring all plant personnel are vigorous in their efforts to detect, investigate, and resolve anomalous conditions such as the leaking air supply to fuel pool inflatable seals. The inspector stated that the observation of an operator who was not alert, reflected an acceptance of poor watchstanding

practices by the individual and his supervision. The inspector also commented that the observation of apparent eating in a radiologically controlled area was indicative of poor radiological controls.

Finally, the inspector commented that the Unit 1 response to the slipped CEA event demonstrated good anticipation and teamwork at resolving the event.

The licensee representative acknowledged the inspector's observations as detailed in this report.