UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

March 20, 2001

Gregg R. Overbeck, Senior Vice
President, Nuclear
Arizona Public Service Company
P.O. Box 52034
Phoenix, Arizona 85072-2034

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION - NRC INSPECTION REPORT NO. 50-528, 50-529, 50-530/01-04

Dear Mr. Overbeck:

On February 2, 2001, the NRC completed a team inspection at Palo Verde Nuclear Generating Station, Units 1, 2, and 3. The enclosed report documents the inspection findings which were discussed on February 2, 2001, with you and other members of your staff on the preliminary results of the onsite inspection. On February 14, 2001, we conducted a telephonic exit meeting with Messrs. B. Ide, Vice President, Nuclear Production, and D. Mauldin, Vice Pesident, Engineering and Support, and other members of your staff to inform your staff of the results of the in-office review following the inspectors' departure from the site. On February 22, 2001, a subsequent telephonic conversation was conducted with Messrs. D. Kanitz, D. Marks, and C. Seaman to inform your staff that this inspection report would also include information regarding performance indicator verification for the occupational radiation protection area.

This inspection was an examination of activities conducted under your license as they relate to verification of performance indicators in occupational radiation protection and the identification and resolution of problems, compliance with the Commission's rules and regulations, and the conditions of your license. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the NRC has identified issues that were evaluated under the risk significance determination process as having very low safety significance (green). The NRC has also determined that violations are associated with these issues. These violations are being treated as noncited violations, consistent with Section VI.A of the Enforcement Policy. These noncited violations are described in the subject inspection report. If you contest the violation or significance of these noncited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Palo Verde Nuclear Generating Station, Units 1, 2, and 3 facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure(s), and your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Anthony T. Gody, Chief
Operations Branch
Division of Reactor Safety

Dockets: 50-528; 50-529; 50-530
Licenses: NPF-41; NPF-51; NPF-74

Enclosure:
NRC Inspection Report
50-528/01-04; 50-529/01-04; 50-530/01-04
w/Attachment 1 - Supplemental Information
Attachment 2 - NRC's Revised Reactor Oversight Process

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SOE:OB	SOE:OB	SOE:OB	SRI:PBD	RI:PBC
TFStetka*	HFBundy*	SMMcCrory*	JMoorman*	MHay*
/**RA**/	/**RA**/	/**RA**/	/**RA**/ **E**	/**RA**/ **E**
03/08/01	03/08/01	03/12/01	03/12/01	03/08/01

C:OB	SHP:PSB	C:PSB	C:OE	C:PBD	D:DRS
ATGody	JBNicholas*	GMGood*	GFSanborn*	LJSmith*	ATHowell
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03/20/01	03/08/01	03/08/01	03/08/01	03/13/01	03/15/01

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Dockets:	50-528; 50-529; 50-530
Licenses:	NPF-41; NPF-51; NPF-74
Report No.:	50-528/01-04; 50-529/01-04; 50-530/01-04
Licensee:	Arizona Public Service Company
Facility:	Palo Verde Nuclear Generating Station, Units 1, 2, and 3
Location:	5951 S. Wintersburg Road Tonopah, Arizona
Dates:	January 29 through February 2, 2001
Inspectors:	T. Stetka, Senior Operations Engineer, Operations Branch H. Bundy, Senior Operations Engineer, Operations Branch S. McCrory, Senior Operations Engineer, Operations Branch J. Moorman, Senior Resident Inspector, Projects Branch D M. Hay, Resident Inspector, Projects Branch C B. Nicholas, Senior Health Physicist, Plant Support Branch
Approved By:	Anthony T. Gody, Chief Operations Branch Division of Reactor Safety

SUMMARY OF FINDINGS

Palo Verde Nuclear Generating Station, Units 1, 2, and 3
NRC Inspection Report 50-528/01-04; 50-529/01-04; 50-530/01-04

IR 05000528-01-04; 05000529-01-04; 05000530-01-04, on 1/29-2/2/2001, Arizona Public Service Company. Palo Verde Nuclear Generating Station, Units 1, 2, and 3; annual baseline inspection of the occupational radiation protection performance indicators and the identification and resolution of problems.

The inspection was conducted by three regional senior operations engineers, a senior health physicist, a senior resident inspector, and a resident inspector. The inspection identified two issues that were evaluated as having very low safety significance (green). The significance of issues was indicated by their color (green, white, yellow, red) and was determined by the Significance Determination Process in Inspection Manual Chapter 0609.

Identification and Resolution of Problems

The licensee was effective at identifying problems and putting them into the corrective action program. The licensee's effectiveness at problem identification was evidenced by the relatively few deficiencies identified by external organizations (including the NRC) that had not been previously identified by the licensee during the review period. The licensee effectively used risk information in prioritizing the extent of evaluation of individual problems and the schedule for implementation of corrective actions. Corrective actions, when specified, were generally implemented in a timely manner. However, there was one instance that is discussed below, where the licensee did not promptly identify and correct an inadequate procedure. Licensee audits and assessments were effective. Based on the interviews conducted during this inspection, workers at the site felt free to input safety issues into the problem identification and resolution program (Section 4OA2.1b;2b;3b;4b).

Cornerstone: Mitigating Systems

GREEN. A noncited violation was identified when the licensee failed to promptly identify and correct an inadequate surveillance procedure that was used to periodically vent the high pressure safety injection system. The procedure failed to include guidance for conducting high pressure safety injection system venting and the acceptance criteria to ensure successful venting. This failure resulted in inadequate high pressure safety injection system venting since February 1997. This was a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI. This violation was entered into the licensee's corrective action program as Condition Report/Disposition Request 2316659 (Section 4OA2a.(2)).

The underlying technical issue, an inadequate surveillance procedure, was assessed by the significance determination process and determined to have very low safety significance because the high pressure safety injection system remained operable.

Cornerstone: Occupational Radiation Safety

GREEN. Three examples of a noncited violation were identified when the licensee failed to conduct radiological surveys for changing radiological conditions. On December 21, 1999, radiological surveys were not conducted to detect changing radiological conditions at the Concentrate Monitor Tank B. On May 4, 2000, radiological surveys were not conducted to detect changing radiological conditions at the Low Pressure Safety Injection Pump B cyclone separator and changing radiological conditions following a drain down of the spent fuel pool transfer canal. As a result, radiological area postings and controls for these areas were inappropriate. These three examples of inadequate radiological surveys were a violation of 10 CFR Part 20.1501. This violation was entered into the licensee's corrective action program as Condition Report/Disposition Requests 113251, 117874 and 117970 (Section 4OA2c.(2)).

These findings were determined to have very low risk significance because there was no overexposure or a substantial potential for an overexposure and the ability to assess radiation doses was not compromised.

Report Details

4. OTHER ACTIVITIES (OA)

4OA1 Performance Indicator Verification (71151)

Occupational Exposure Control Effectiveness

a. Inspection Scope

The team reviewed corrective action program records for high radiation areas, locked high radiation areas, and unplanned exposure occurrences for the past 12 months to confirm that these occurrences were properly recorded as performance indicators.

b. Issues and Findings

During the review of Condition Report/Disposition Request (CRDR) 117874, "Hot spot identified on LPSI [low pressure safety injection] Pump B cyclone separator," dated May 4, 2000, the team determined that the licensee's identification of a locked high radiation area near the Unit 3 LPSI Pump B cyclone separator, which read 1200 millirem per hour at 30 centimeters on May 4, 2000, had not been reported as a performance indicator occurrence in the Occupational Radiation Safety Cornerstone. The details of this event are discussed in Section 4OA2c.(2) of this inspection report. The licensee determined that the event did not meet the NRC performance indicator reporting threshold because, based on prior history, there was no reason to anticipate an increase in radiological dose rates which could result in locked high radiation area conditions in the Unit 3 LPSI pump room following running of the pump in the shutdown cooling mode. The licensee concluded that since dose rates on numerous surveys indicated that the cyclone separator dose rates were not increasing following the cycling of reactor coolant pumps, and that the LPSI pump room dose rates were closely monitored up until shutdown cooling was secured at 11:15 a.m. on April 29, 2000, that a sufficient number of surveys were conducted. Therefore, the licensee determined that they maintained control of the locked high radiation area and that the performance indicator was not exceeded.

Following review of this event, the team concluded that the licensee should have anticipated a change in radiological conditions following the start of a reactor coolant pump that occurred prior to securing the LPSI pump from the shutdown cooling mode, due to the crud burst conditions that existed at the time. The team further concluded that the licensee did not take adequate surveys to assess the changing radiological conditions and, as a result, did not control the area as a locked high radiation area for approximately 5 1/2 days after securing the shutdown cooling operation. Accordingly, the team determined that the event should have been reported as a performance indicator because the inadequate surveys caused a loss of control of the locked high radiation area. The team also noted that reporting this issue as a performance indicator occurrence will not cause a performance indicator threshold to be crossed. Based on the differing interpretations of this performance indicator reporting threshold between the licensee and the NRC, this issue remains under review pending resolution of this issue by the NRC Office of Nuclear Reactor Regulation. This issue is considered to be an unresolved item (50-530/0104-01).

4OA2 Identification and Resolution of Problems

a. Effectiveness of Problem Identification

(1) Inspection Scope

The team reviewed items selected across the seven cornerstones to determine if problems were being properly identified, characterized, and entered into the corrective action program for evaluation and resolution. Specifically, the team selected approximately 130 condition reports/disposition requests, which had been issued between December 1999 and January 2001. The team also reviewed three licensee audits, one of which was of the corrective action program, and two self-assessments. The effectiveness of the audits and assessments was evaluated by comparing the audit and assessment results against self-revealing and NRC-identified issues.

The team evaluated the condition report/disposition requests to determine the licensee's threshold for identifying problems and entering them into the corrective action program. Also, the licensee's efforts in establishing the scope of problems were evaluated by reviewing pertinent control room logs, radiation protection logs, work orders, audit and self-assessment results, action plans, and results from surveillance tests and preventive maintenance tasks. The condition report/disposition requests and other documents listed in Attachment 1 to this report were used to facilitate the review.

(2) Issues and Findings

The team determined that the licensee was effective at identifying problems and entering them into the corrective action program. This was evidenced by the relatively few deficiencies identified by external organizations (including the NRC) that had not been previously identified by the licensee during the review period. Licensee audits and assessments were of good depth and identified issues similar to those that were self-revealing or raised during previous NRC inspections. Also, during this inspection there were no instances identified where conditions adverse to quality were being handled outside the corrective action program. However, while no significant problems resulted, the team identified that the licensee failed to promptly identify and correct an inadequate procedure.

The team reviewed Condition Report/Disposition Request 2307016, "Unit 2 SIT [safety injection tank] 1A leakage into the HPSI [high pressure safety injection] "B" header via 2JSIBUV636," initiated on July 23, 2000. The team also reviewed the evaluation for this condition report/disposition request that was completed on December 20, 2000. In addition, the team reviewed Condition Report/Disposition Request 2316659, "Nitrogen Gas Accumulation in the HPSI Header," initiated on August 30, 2000, and the evaluation that was completed on December 13, 2000.

Condition Report/Disposition Request 2307016 documented that a large amount of gas was vented from the Unit 2 HPSI System "B" train during the performance of surveillance Procedure 40ST-9SI07, "High Pressure Safety Injection System Alignment

Verification," Revision 1, on July 23, 2000. This gas entered the HPSI system because nitrogen-entrained water leaking from Safety Injection Tank 1A through high pressure safety injection motor-operated Valve 2JSIBUV636 caused a release of nitrogen gas into the system. Procedure 40ST-9SI07 was performed every 31 days to verify that emergency core cooling system piping was full of water, as required by Technical Specification Surveillance Requirement 3.5.3.2. The licensee performed Operability Determination 2314253, dated August 22, 2000, and concluded that the HPSI system remained operable even though the system was not full of water. The licensee initiated Condition Report/Disposition Request 2316659 to assess the adequacy of Procedure 40ST-9SI07. The condition report/disposition request evaluation determined that Procedure 40ST-9SI07 was inadequate because it did not provide proper guidance for conducting a system vent and did not have acceptance criteria to ensure successful venting. The team noted that nitrogen gas leakage into the HPSI system from the safety injection tanks occurred from February 1997 to October 2000 and that the inadequate procedure allowed gas to remain in the system. The licensee issued Licensee Event Report 50-529/2000-03 on September 27, 2000, to report the inadequate procedure problem.

From the review of Condition Report/Disposition Request 2307016, the team determined that the licensee's assessments of the following condition report/disposition requests represented previous opportunities to identify and correct the inadequacies in Procedure 40ST-9SI07:

- Condition Report/Disposition Request 2-7-0069, "Significant amount of air vented from HPSI Train A," dated February 25, 1997, documented the discovery of a small amount of gas in Unit 2 HPSI system Train A during system venting on February 20, 1997. The licensee did not evaluate the system condition in this condition report/disposition request and closed the condition report/disposition request to trend the condition.

- Condition Report/Disposition Request 9-7-Q409, "Assessment of NRC Information Notice 97-40," dated December 12, 1997, documented the licensee's evaluation of Information Notice 97-40, "Potential Nitrogen Accumulation Resulting From Backleakage From Safety Injection Tanks," which was issued to alert the nuclear industry of potential problems from nitrogen accumulation in systems interfacing with the safety injection tanks. The licensee's condition report/disposition request evaluation discussed the existence of significant safety injection tank leakage into the Unit 2 HPSI system, but did not assess the affects of the inleakage on the operability of the HPSI system or assess how this condition affected compliance with technical specifications.

- Condition Report/Disposition Request 107982, "Unusual amount of air vented from HPSI Train B," dated October 20, 1999, documented another HPSI venting event that occurred on October 17, 1999. This condition report/disposition request was also closed to trend the condition and referenced the disposition of Condition Report/Disposition Request 2-7-0069 as the basis for closure.

Criterion XVI of 10 CFR Part 50, Appendix B, states, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, the licensee failed to promptly identify and correct an inadequate procedure for performing HPSI system venting. This failure prevented fulfilment of Technical Specification Surveillance Requirement 3.5.3.2. This violation of 10 CFR Part 50, Appendix B, Criterion XVI is being treated as a noncited violation consistent with Section VI.A.1 of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Condition Report/Disposition Request 2316659 (50-528;529;530/01004-02).

The team reviewed Condition Report/Disposition Request 2316659 and determined that, based on the licensee's data and calculations, the HPSI system was operable and would have performed its design function with the voids present. Using the Significance Determination Process, the team determined that HPSI system voiding was of very low safety significance (Green) because the HPSI system would have remained capable of performing its required safety function.

b. Prioritization and Evaluation of Issues

(1) Inspection Scope

The team reviewed approximately 130 condition reports/disposition requests, and supporting documentation, including an appropriate analysis of the cause of the problem, to ascertain whether the licensee's evaluation of the problems identified and considered the full extent of conditions, generic implications, common causes, and previous occurrences. In addition, the team reviewed the licensee's evaluation of selected industry experience information, including operating event reports and NRC and vendor generic notices, to assess if issues applicable to the Palo Verde Nuclear Generating Station were appropriately addressed. Specific items reviewed are listed in Attachment 1 to this report.

(2) Issues and Findings

Based on a review of the licensee's records, the team concluded that the licensee effectively prioritized and evaluated issues. The team identified no findings related to prioritization and evaluation of issues. The licensee appropriately characterized and evaluated issues that were significant conditions adverse to quality.

c. Effectiveness of Corrective Actions

(1) Inspection Scope

The team reviewed condition reports/disposition requests, audits and self-assessments to verify that corrective actions, related to the issues, were identified and implemented in

a timely manner commensurate with safety, including corrective actions to address common cause or generic concerns. The team also interviewed plant personnel to independently verify and assess the effectiveness of corrective actions implemented by the licensee. A listing of specific documents reviewed during the inspection is included as Attachment 1 to this report.

(2) Issues and Findings

Based on a review of the licensee's records, the team concluded that, in general, the licensee's corrective actions were effective. However, the team also determined that corrective actions associated with a condition report/disposition request was narrowly focused and, as a result, failed to prevent the recurrence of the events subsequently identified in other condition report/disposition requests. These condition report/disposition requests pertained to inadequate radiological surveys performed to satisfy radiological area posting and control requirements. Documentation of the identification and evaluation of these events were included in Condition Report/Disposition Requests 113251, 117874, and 117970.

Condition Report/Disposition Request 113251

Condition Report/Disposition Request 113251, "LHRA [Local High Radiation Area] conditions found on concentrate monitor tank," dated December 21, 1999, identified an event involving the transfer of evaporator concentrates to concentrate monitor Tank B in Unit 3 on December 20, 1999. Although a radiological survey was performed for the concentrate monitor tank room, following the transfer of concentrates, on December 20, 1999, the tank containing the concentrates was not surveyed. Subsequently, during a routine radiological survey on December 21, 1999, the concentrate monitor tank was found to have radiation exposure levels of up to 1300 millirems per hour. While still posted as a high radiation area, the radiation exposure level of 1300 millirems per hour required posting as a locked high radiation area and that the area be controlled with a locked door or a flashing light. The licensee entered this issue in its corrective action program as Condition Report/Disposition Request 113251.

The licensee's evaluation of Condition Report/Disposition Request 113251 determined that several root causes resulted in the failure to perform an adequate survey. These causes included inadequate understanding of system operation relative to changing radiological conditions and inadequate communications between the operations and radiation protection departments. The evaluation also determined that this issue was transportable to all the units anytime a system evolution occurs that has a potential to change the radiological conditions. During review of the corrective actions associated with Condition Report/Disposition Request 113251, the team noted that the corrective actions were narrowly focused. Specifically, the corrective actions pertained to developing radiological survey guidelines and access controls only with respect to waste process system changes. These corrective actions did not address other systems throughout the plant that could also exhibit changing radiological conditions as a result of plant evolutions.

Condition Report/Disposition Request 117874

Condition Report/Disposition Request 117874, "Hot spot identified on LPSI [Low Pressure Safety Injection] Pump B cyclone separator," dated May 4, 2000, identified an event involving the Unit 3 LPSI Pump B cyclone separator radiation level. Specifically, during a routine radiological survey performed on May 4, 2000, at 10:30 p.m., radiation levels up to 1200 millirems per hour were identified at 30 centimeters from the LPSI Pump B cyclone separator, which required the area to be posted and controlled as a locked high radiation area. However, the area was only posted and controlled as a high radiation area.

The team reviewed this event and determined that on April 29, 2000, LPSI Pump B was in operation to support shutdown cooling of the Unit 3 reactor. At 11:15 a.m. on April 29 LPSI Pump B was secured. The team noted that the licensee's evaluation of this event determined that the unanticipated increase in radiation exposures on the cyclone separator resulted after LPSI Pump B was secured. The licensee's evaluation was based on the following determinations: (1) dose rates on numerous surveys indicated that the cyclone separator dose rates had not increased but remained stable following a crud burst that occurred after cycling reactor coolant pumps; (2) LPSI Pump B room area dose rates were closely monitored up until the shutdown cooling lineup was secured at 11:15 a.m. on April 29. Therefore, the licensee concluded that its survey activities were adequate.

The team reviewed control room logs, radiation protection logs, and radiological surveys to assess the licensee's evaluation of the event. Following the review of this information, the team determined that the licensee had not effectively evaluated this event.

The team found that the radiological surveys did not clearly indicate that the cyclone separator dose rates were stable during the crud burst. At 3:19 a.m. on April 29, following the cycling of reactor coolant pumps, the licensee determined that a crud burst had occurred. At 5:13 a.m., a radiological survey taken on the LPSI Pump B cyclone separator noted a change in radiation exposure levels from 100 millirems per hour to 600 millirems per hour. Two additional surveys were performed at 7:30 and 9:17 a.m. However, these surveys were recorded as radiation protection log entries that stated, "Dose rates confirmed to be within current posted conditions. 'B' LPSI dose rates consistent with 5:13 a.m. survey log entry."

While the team noted that the LPSI Pump B room dose rates were closely monitored until 9:17 a.m., the team also noted that the LPSI system continued to run until 11:15 a.m. and that reactor coolant Pump 2B was started at 9:57 a.m. The team also noted that the licensee did not perform additional surveys of the LPSI system during this period when the LPSI system continued to run in the shutdown cooling mode and a

reactor coolant pump was started, to determine if this change in system operation caused a radiation dose rate increase. The LPSI system shutdown cooling was secured at 11:15 a.m. on April 29, 2000, and the next survey of this area was not performed until approximately 5 1/2 days later at 10:30 p.m. on May 4, 2000. It was at that time when the licensee discovered that the dose rates exceeded 1000 millirems per hour.

In addition, the team noted that the Unit 3 LPSI Pump B cyclone separator had temporary shielding that was installed prior to April 28, 2000. The licensee indicated that the shielding was installed around the cyclone separator to reduce the radiation exposure from this component. The licensee further indicated that the cyclone separators in all three units were hot spots and have had temporary shielding installed to reduce the radiation levels in those areas. As of May 5, 2000, the LPSI Pump B cyclone separator had two temporary shielding packages installed around it to reduce the radiation levels. The team was informed that the cyclone separators become radiological hot spots because their function was to remove particulates from the LPSI pump gland seal supply water. When the LPSI system was in a shutdown cooling line up, increased levels of particulates in the system, created by crud bursts or operational transients, increased the radiation levels in this system, especially in the cyclone separators where the particulates were concentrated.

Based on this review, the team determined that the licensee failed to perform an adequate survey of the LPSI Pump B cyclone separator on April 29, 2000. Specifically, at 5:13 a.m., on April 29, the LPSI Pump B cyclone separator radiation levels increased from approximately 100 to 600 millirems per hour following the cycling of reactor coolant pumps. At 9:57 a.m. an additional reactor coolant pump was started creating the potential for crud to be relocated throughout the system, thus, increasing radiation levels. Following the survey taken at 9:17 a.m. on April 29, no additional surveys were performed on the LPSI Pump B cyclone separator until 10:30 p.m. on May 4, 2000. This issue was entered in the licensee's corrective action program as Condition Report/Disposition Request 117874.

Condition Report/Disposition Request 117970

Condition Report/Disposition Request 117970, "Personnel EPD [Electronic Personnel Dosimeter] alarmed near spent fuel pool," dated May 4, 2000, identified an event, whereas, an individual's electronic personnel dosimeter alarmed on high dose rate while the individual was working near the spent fuel pool. Radiological surveys were performed and identified that the person was working in an unposted high radiation area with general area radiation levels up to 150 millirems per hour. The licensee’s evaluation determined that the water level in the spent fuel pool transfer canal was lowered on May 1 causing general area dose rates to increase. Although operations personnel informed radiation protection personnel that they were draining down the water level, radiation protection personnel failed to perform a radiological survey to evaluate for changing radiological conditions. Subsequently, the area went from a radiation area to a high radiation area and the required high radiation area postings and controls were not implemented. This issue was documented in the licensee's corrective action program as Condition Report/Disposition Request 117970.

10 CFR 20.1501 requires that each licensee make or cause to be made surveys that may be necessary for the licensee to comply with the regulations in Part 20 and that are reasonable under the circumstances to evaluate the extent of radiation levels, concentrations or quantities or radioactive materials, and the potential radiological hazards that could be present.

Pursuant to 10 CFR 20.1003, survey means an evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive material or other source of radiation.

10 CFR 20.1601(c) allows licensee's to apply for approval of alternative methods of controlling access to high radiation areas. Technical Specification 5.7.1 states, in part, "In addition to the provisions of 10 CFR 20.1601, the following controls provide an alternative method for controlling access to high radiation areas as provided by paragraph 20.1601(c) of 10 CFR Part 20. High radiation areas, as defined in 10 CFR Part 20, in which the intensity of radiation is greater than 100 millirems per hour but less than or equal to 1000 millirems per hour, shall be barricaded and conspicuously posted as a high radiation area." In addition, Technical Specifications 5.7.2 and 5.7.3 require that individual high radiation areas that are accessible to personnel with radiation levels such that an individual could receive in 1 hour a dose in excess of 1000 millirems at 30 centimeters, be barricaded and conspicuously posted, and controlled with either a locked door or a flashing light that is activated as a warning device.

The failure to perform an adequate survey of concentrate monitor Tank B on December 20, 1999, and the failure to perform an adequate survey of the LPSI Pump B cyclone separator following conditions which could cause radiation levels to significantly change resulting in the failure to properly control a locked high radiation area are the first and second examples of a violation of 10 CFR 20.1501. The failure to perform an adequate survey of the spent fuel pool area resulted in a failure to post and properly control a high radiation area and is the third example of a violation of 10 CFR 20.1501.

These three examples are being treated as a noncited violation (50-528; 529; 530/01004-03) consistent with Section VI.A of the NRC Enforcement Policy. Using the significance determination process, this noncited violation was characterized as having very low safety significance (Green) because there was no overexposure or substantial potential for an overexposure, and the ability to assess radiation dose was not compromised.

The team noted that the licensee considered the events identified in Condition Reports/Disposition Requests 113251 and 117970 to be the result of inadequate surveys. However, the team also noted that the licensee considered the survey taken during the event identified in Condition Report/Disposition Request 117874 to be adequate. Nonetheless, the licensee's corrective actions associated with Condition Report/Disposition Request 117874 focused on improving radiation survey techniques. Specifically, the following corrective actions were implemented: (1) Radiation protection management guidance was developed to identify specific surveillance requirements to be used during relevant plant operational evolutions. This guidance described each flow path involved, monitoring to be performed, and specific lessons learned from past

events; (2) Enhanced remote monitoring was developed to closely monitor changing radiological conditions that occur during post outage plant start-up evolutions. The licensee also indicated that radiation protection technicians would receive additional system training to improve their plant knowledge. The team determined that these corrective actions appeared appropriate to address the apparent problems the licensee had experienced with respect to performing surveys.

d. Assessment of Safety Conscious Work Environment

(1) Inspection Scope

The team interviewed approximately 25 individuals from the licensee's staff, which represented a cross-section of functional organizations and supervisory and non-supervisory personnel. These interviews assessed whether conditions existed that would challenge the establishment of a safety conscious work environment.

(2) Issues and Findings

Based on interviews, the team identified no findings related to the safety conscious work environment. The team concluded, based on information collected from these interviews, that employees were willing to identify issues and accepted the responsibility to proactively identify and enter safety issues into the corrective action program.

4OA3 Event Follow-up

(1) (Closed) Licensee Event Report 50-529/2000-001-00: Reactor Trip Due To Unexpected Closure of Main Steam Isolation Valves. A failed power supply in the Train A main steam/feedwater isolation valve logic cabinet resulted in the closure of all four main steam isolation valves and two of four economizer isolation valves. The team reviewed the licensee event report and no findings of significance were identified. The cause of this event has been addressed and corrected through the licensee's corrective action program and documented in Condition Report/Disposition Request 2315636, "At approximately 15:40 Unit 2 tripped from 100% power. Preliminary information indicates that the main steam isolation valves in the "A" train went closed." dated August 29, 2000. This event did not constitute a violation of NRC requirements.

(2) (Closed) Licensee Event Report 50-529/2000-003-00: Emergency Core Cooling System Surveillance Requirement Not Met Due to Inadequate Procedure. On July 23, 2000, Unit 2 operators vented the Unit 2 Train B HPSI system to meet a technical specification surveillance requirement. A large amount of gas was vented from the system, indicating the presence of nitrogen gas voids in the piping. The licensee's assessment of this condition in Condition Report/Disposition Request 2316659 determined that Surveillance Procedure 40ST-9SI07 was inadequate. In addition, the licensee identified past occurrences which ranged from February 1997 to October 2000, when the HPSI system

was not adequately vented every 31 days as required by Technical Specification Surveillance Requirement 3.5.3.2. Operability Determination 2314253 concluded that the HPSI system remained capable of performing its safety function in this condition. Based on this fact, the risk significance of this issue was characterized as very low (Green) consistent with the significance determination process (See Section 4OA2a(2) for further details).

(3) (Closed) Licensee Event Report 50-529/2000-007-00: Reactor Trip Caused by a Failure to Follow an Operations Procedure. On November 18, 2000, Unit 2 experienced a reactor cut-back resulting from a turbine-generator component fault. The fault occurred during a special electrical test while the reactor was at 100 percent power. Following the reactor cut-back, the reactor operator manually inserted reactivity at a rate sufficient to cause an auxiliary variable over power trip. Procedure 40AO-9ZZ08, "Load Rejection," Revision 4, stated to either stabilize power at a power level of $\geq$20 percent power or lower power to $\leq$12 percent power following a reactor cutback before adjusting reactivity to control temperature and azimuthal tilt. Contrary to this procedure requirement, on November 18, 2000, the Unit 2 operators did not stabilize power at $\geq$ 20 percent nor lower power to $\leq$ 12 percent, before adjusting reactivity. As a result, the rate of reactivity change from manual control element assembly movement and simultaneous boration caused a reactor trip when the core protection calculator auxiliary variable over power trip setpoint was exceeded. This failure to follow Procedure 40AO-9ZZ08 was considered to be a licensee identified violation of Technical Specification 5.4.1 (See Section 4OA7(1)) and is in the licensee's corrective action program as Condition Report/Disposition Request 2339523. The team evaluated the licensee's corrective actions and determined that they were adequate. This closure dispositions Unresolved Item 50-529/0010-01.

4OA6 Meetings, including Exit

Exit Meeting

The team debriefed Mr. G. Overbeck, Senior Vice President, Nuclear, and members of the licensee's staff, on the preliminary inspection findings at the conclusion of the onsite inspection on February 2, 2001.

The team leader asked the licensee's management whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

A telephonic exit meeting was held on February 14, 2001, with Messrs. B. Ide, Vice President, Nuclear Production, and D. Mauldin, Vice President, Engineering and Support, and other licensee staff members during which the team leader characterized the results of the inspection and the in-office review following the team's departure from the site. The licensee's management acknowledged the findings presented.

4OA7 Licensee Identified Violations

The following findings of very low significance were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600 for being dispositioned as noncited violations (NCV).

	NCV Tracking Number	Requirement Licensee Failed to Meet
(1)	NCV 528/0104-04	On November 18, 2000, Unit 2 experienced a reactor cut-back resulting from a turbine-generator component fault. Following the reactor cut-back, the reactor operator manually inserted reactivity at a rate sufficient to cause an auxiliary variable over power trip. The licensee determined that the reason for the reactor trip was that the load rejection procedure, which required that the reactor be stabilized at $\geq$ 20% power or $\leq$ 12% power, was not followed. This was a violation of Technical Specification 5.4.1.
(2)	NCV 530/0104-05	On October 3, 1998, maintenance personnel failed to follow work order instructions for torqueing fuel supply lines on the Unit 3 “A” emergency diesel generator. As a result, a fuel supply line detached from a cylinder on the diesel generator during a load test conducted on April 22, 2000. This was a violation of Technical Specification 5.4.1.

ATTACHMENT 1

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Bungard, Technical Manager Assistant for Radiation Protection
T. Gray, Department Leader Radiation Support
A. Fernandez, Mechanical Maintenance Engineer
D. Kissinger, Senior Engineer Engineering Services
J. Gaffney, Radiation Protection Director
S. Payne, Diesel Generator System Engineer
P. Sahay, Senior Engineer, Electrical Design
T. Braddish, Engineering Section Leader
M. Van Dop, Section Leader, System Engineering
K. Angstrom, Auxiliary Feedwater System Engineer
M. Sontag, Department Leader, Nuclear Assurance Division (NAD)
W. Weems, Electrical Supervisor
S. Barbera, Electrical Engineer
J. Daniel, Electrical Team Leader
M. Salazar, Technical Assistant
J. McGrath, Maintenance Advisor
B. Lindenlaub, Appendix J Engineer
B. Hunnicutt, IST Engineer
B. Blackmore, Safety Injection System Engineer
B. Johnson, PDM Lubrication Engineer
G. Andrews, Section Leader, Operations
R. Buzard, Senior Consultant, Nuclear Regulatory Affairs
M. Fladager, Department Leader, Radiation Protection Operations
S. Lantz, Section Leader, Radiation Protection Operations

NRC

J. Pellet, Chief, Operations Branch, Division of Reactor Safety

ITEMS OPENED AND CLOSED

Opened and Closed

50-528; 529; 530/0104-02	NCV	Failure to promptly identify and correct an inadequate HPSI system venting procedure (Section 4OA2a.(2)).
50-528; 529; 530/0104-03	NCV	Failure to conduct adequate radiation surveys (Section 4OA2c.(2)).
50-528/0104-04	NCV	Reactor trip caused by a failure to follow an operations procedure (Section 4OA7(1)).

50-530/0104-05	NCV	Emergency diesel generator fuel oil line failure due to a failure to follow a maintenance procedure (Section 4OA7(2)).

Opened

50-530/0104-01	URI	Occupational Radiation Safety PI reporting issue (4OA1b.)

Closed

50-529/0010-01	URI	Assessment of operator response to Unit 2 reactor trip on November 11, 2000 (Section 4OA3(3)).
50-529/2000-001-00	LER	Reactor Trip Due Unexpected Closure of Main Steam Isolation Valves (Section 4OA3(1)).
50-529/2000-003-00	LER	Emergency Core Cooling System (ECCS) Surveillance Requirement Not Met Due to Inadequate Procedure (Section 4OA3(2)).
50-529/2000-007-00	LER	Reactor trip caused by a failure to follow an operations procedure (Section 4OA3(3)).

PARTIAL LIST OF DOCUMENTS REVIEWED

The following documents were selected and reviewed by the team to accomplish the objectives and scope of the inspection and to support any findings:

Condition Report/Disposition Requests (CRDRs)

2304782	118577	115384	2332313	34939	87361	36849
53818	2333493	2329665	116836	117201	36453	117203
990368	111812	114865	116392	117565	2332362	102263
232955	115436	111721	118434	36518	2305216	2308926
2321174	2324452	2316982	116807	117225	117385	2352057
117474	2303693	231294	2326573	2326575	2326580	2335502
2335506	2325921	2333993	9-9-0443	34870	2-9-0102	115358
115571	115997	2348844	118157	113265	115980	116255
2307944	2315636	2316659	2307016	2341398	116571	2317329

2329443	2332280	116858	110737	110886	114665	111626
113251	115584	115588	115711	115854	116095	116200
116811	117457	117562	117874	117970	118362	2304182
2314791	2319035	2324407	2326554	2330205	2337040	2345330
2351080	2305275	110932	34906	34549	35033	2339523
2316994	2326705	2332280	2330178	118343	2347520	111821
116864	95468	2329667	2345583	2324096	117508	118040
2346059	2340984	2346081	2317836	115853	116669	2314425
118239	2314478	2333305	2307203	2303734	119211	2343698
2317252	115005	109083	2341456			

Condition Report Action Items (CRAIs)

2317124	2321845	34871	119772	119770	119774	119792
2303325						

Work Orders

2309075 Remove and replace lube oil pressure relief valve on 1MAFAP01, (no date)

2324621 Change oil in both pump bearing locations on 3MAFAP01, 10/2/00

00840974 Diesel engine piston modification, 9/23/98

00760963 Removal and replacement of fuel hoses from diesel engine, 10/5/98

Audits and Self-Assessments

Integrated Issues Resolution Audit 00-013, November 6-17, 2000

Audit Report 99-001, “Emergency Planning Audit,” February 24, 1999

Corrective Action Self-Assessment Audit 00-011, August 7-18, 2000

Nuclear Assurance Division Self-Assessment of the Significant Investigation Program, July 2000

Operating Experience Self-Assessment 2000, December 28, 2000

Licensee Event Reports (LERs)

50-529/2000-004-00	"Leak in Inconel Alloy 600 pressurizer heater sleeve," 11/1/00
50-528;529;530/2000-003-00	“Inappropriate Procedure Setting in VOPT [Variable Over-Power Trip] Channels,” 7/8/00
50-529/2000-006-00	"Entry into TS 3.0.3 due to SIT outlet check valve not seated," 12/4/00
50-529/2000-002-00	"MSSV [Main Steam Safety Valve] Lift Pressures Outside of TS Limits," 9/27/00

Procedures

Procedure	Title	Revision
90DP-OIP10	Condition Reporting	10
40ST-9SI07	High Pressure Safety Injection System Alignment Verification	1
73DP-9ZZ05	Lubrication of Plant Equipment	13
36ST-9SB02	PPS [Plant Protection System] Bistable Trip Units Functional Test	22
13-JC-SE-0202	Ex-Core Safety Channel Linear Power Instrument (SEx-J-001x) Setpoint and Uncertainty Calculation (X=A,B,C,D)	8

Miscellaneous Documents

Monthly CRDR Program Report, November 2000

Palo Verde Nuclear Generating Station Third Quarter of 2000 Trend Report

Unit 3 “A” diesel generator test records from10/3/98 through 4/22/00

Radiological Surveys 10002132, 10002133, 20004113, 20004114, 30000523, 30001232, 30002328, 30002339, 30002475

Unit 3 control room logs from 4/28/00 through 5/5/00

Unit 3 reactor coolant activity sample results from 4/25/00 through 4/30/00

Unit 3 radiation protection logs from 4/28/00 through 5/5/00

MATERIAL REQUESTED

All procedures governing or applying to the corrective action program, including the processing of information regarding generic communications and industry operating experiences.

a. Procedures and descriptions of any informal systems, especially those used by operations, for issues below the threshold of the formal corrective action program

b. A listing and index of all corrective action documents (e.g., Condition Report/Disposition Requests (CRDRs)), sorted by department (e.g., engineering, maintenance, operations, etc.), for the period of December 1999 through the present.

c. A list of all corrective action documents that subsume or roll-up one or more smaller issues for the period of December 1999 through the present.

d. All audits or assessments performed for the period of December 1999 through the present on the corrective action program.

e. For each of the CRDRs listed below please provide the following:

- Full text of the CRDR (please indicate any findings that did not result in an CRDR or corrective actions)
- Any “Roll-up” or “Aggregating” CRDRs related to the generic communications or a number of other CRDRs
- Root cause analysis report (if applicable)
- Risk significance assessments
- Probable cause evaluation (if applicable)
- Approved corrective actions
- Basis for extending originally approved due dates
- Evidence of corrective action completion (work packages, design change documentation, temporary modifications, training lesson plans/material, training attendance records, procedure revisions, etc.):

115588	115711	115584	990835	116095	2-8-0236
2-9-0229	102002	2316982	9700078	2329255	2316659
2324407	2330178	2329894	2329667	2341398	2345299
2329665	2341253	2317248	2316424	2304782	116836
2321236	118343	115358	117835	115457	2332362
102263	115436	111721	115436	102263	118434
111812	114865	116200	116392	116433	117565
118157	2305216	2308926	2315636	2317329	2321174

2329443	2331089	2332280	2332313	2333493	113265
115384	115980	116255	116571	117201	117203
118577	2307944	2321393	2333810		

- For each of the generic communications listed below please provide the following:

  - Full text of any CRDRs written (please indicate any findings that did not result in an AR or corrective actions)
  - Any “Roll-up” or “Aggregating” CRDRs related to the generic communications
  - Root cause analysis report (if applicable)
  - Risk significance assessments
  - Approved corrective actions
  - Basis for extending originally approved due dates
  - Evidence of corrective action completion (work packages, design change documentation, temporary modifications, training lesson plans/material, training attendance records, procedure revisions, etc.)

  Part 21 Reports
  (The following numbers are found on the NRC web site for Part 21 Reports)

  2000-02
  2000-05
  2000-06
  2000-10
  2000-12
  2000-18
  2000-23
  2000-24
  2000-27

  NRC Generic Letter

  99-002

  NRC Information Notices

  00-06
  00-08
  00-09
  00-12
  00-17
  00-20

- For each of the LERs listed below please provide the following:

  - Full text of any CRDRs written (please indicate any findings that did not result in an AR or corrective actions)
  - Any “Roll-up” or “Aggregating” CRDRs related to the generic communications

- Root cause analysis report (if applicable)
- Risk significance assessments
- Approved corrective actions
- Basis for extending originally approved due dates
- Evidence of corrective action completion (work packages, design change documentation, temporary modifications, training lesson plans/material, training attendance records, procedure revisions, etc.):
  50-528/2000-001
  50-528/2000-002
  50-528/2000-003
  50-529/2000-001
  50-529/2000-002
  50-529/2000-003
  50-529/2000-004
  50-529/2000-007
  50-528, 529, 530/2000-003

In addition, if there were additional LERs (e.g., those that were not yet captured by the NRC web site) that were written during the period of December 1999 through the present, please provide the same information for those LERs.

- A listing of all the Root Cause Analyses performed during the period of December 1999 through the present.

- A listing of any and all Significant Conditions Adverse to Quality that were identified during the period of December 1999 through the present.

- Safeguard Event Logs for the period of December 1999 through the present.

- Radiation Protection Logs for the period of December 1999 through the present.

ATTACHMENT 2

NRC'S REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	**Radiation Safety**	**Safeguards**
•Initiating Events	•Occupational	•Physical Protection
•Mitigating Systems	•Public	
•Barrier Integrity		
•Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC used two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Using the significance determination process, inspection findings will be evaluated according to their potential significance for safety and assigned colors of GREEN, WHITE, YELLOW, or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, or RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and the inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http:\\www.nrc.gov\NRR\OVERSIGHT\index.html.