UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

March 6, 2006

James M. Levine, Executive Vice
President, Generation
Arizona Public Service Company
P.O. Box 52034
Phoenix, AZ 85072-2034

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION - NRC INSPECTION REPORT 05000528/2005008

Dear Mr. Levine:

On January 31, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Palo Verde Nuclear Generating Station, Unit 1 facility. The enclosed report documents the inspection findings, which were discussed on January 31, 2006, with Mr. Eubanks and other members of your staff.

The inspection examined activities conducted under your licenses as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. This inspection covers steam generator replacement activities at the Palo Verde Nuclear Generating Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) 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/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Troy W. Pruett, Chief
Project Branch D
Division of Reactor Projects

Dockets: 50-528

License: NPF-41

Enclosure:
NRC Inspection Report 05000528/2005008
w/Attachment: Supplemental Information

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**ROPreports**
PV Site Secretary **(PRC)**

SUNSI Review Completed: __TWP_ ADAMS: / Yes ☐ No Initials: TWP____
/ Publicly Available ☐ Non-Publicly Available ☐ Sensitive / Non-Sensitive

R:_REACTORS_PV\2005\PV2005-008RP-JFM.wpd

| RIV:RI:DRP/D | RI:DRP/D | SRI:DRP/D | SPE:DRP/D |
|---|---|---|---|
| JFMelfi | PLBenvenuto | GGWarnick | GEWerner |
| **T-TWP** | **T-TWP** | **T-TWP** | **T-TWP** |
| 02/15/06 | 02/15/06 | 02/15/06 | 02/15/06 |

| C:DRS/PSB | C:DRS/OB | C:DRS/EB1 | C:DRS/EB2 | C:DRP/D |
|---|---|---|---|---|
| MPShannon | ATGody | JAClark | LJSmith | TWPruett |
| **/RA/** | **/RA/** | **RLBywater for** | **/RA/** | **/RA/** |
| 03/03/06 | 03/03/06 | 03/02/06 | 03/01/06 | 03/06/06 |

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**U.S. NUCLEAR REGULATORY COMMISSION**
**REGION IV**

| | |
|---|---|
| Dockets: | 50-528 |
| Licenses: | NPF-41 |
| Report: | 05000528/2005008 |
| Licensee: | Arizona Public Service Company |
| Facility: | Palo Verde Nuclear Generating Station, Unit 1 |
| Location: | 5951 S. Wintersburg Road<br>Tonopah, Arizona |
| Dates: | January 1, 2005 through January 31, 2006 |
| Inspectors: | B. Baca, Health Physicist, Plant Support Branch<br>P. Benvenuto, Resident Inspector<br>D. Livermore, Reactor Inspector<br>J. Melfi, Resident Inspector<br>W. Sifre, Reactor Inspector, Engineering Branch<br>G. Warnick, Senior Resident Inspector<br>G. Werner, Senior Project Engineer, Project Branch D |
| Accompanying Personnel: | B. P. Smith, Reactor Inspector<br>Nuclear Safety Professional Development Program |
| Approved By: | Troy W. Pruett, Chief, Branch D<br>Division of Reactor Projects |

## SUMMARY OF FINDINGS

IR 05000528/2005008; 1/1/05 - 1/31/06; Palo Verde Nuclear Generating Station, Unit 1; Integrated Resident and Regional Report of Steam Generator Replacement Activities.

This report covered a 13-month period of inspection by resident and regional inspectors. No findings were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is describe in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

## REPORT DETAILS

Plant Status

Unit 1 shutdown October 8, 2005, for the twelfth refueling outage. The outage was completed on December 23, and the unit reached 32 percent power on December 25. Due to vibration limitations on shutdown cooling suction Valve 1JS1AUV0651, the unit remained at 32 percent power until January 15, 2006, when the unit downpowered to 25 percent for the installation of a mass-dampening modification to reduce the vibrations. Unit 1 shutdown on January 17, 2006, to complete the mass-dampening modification. The modification was removed following unsatisfactory results for reducing vibration. The unit returned to approximately 26 percent power on January 21, 2006, and remained there for the duration of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R08 Inservice Inspection Activities (71111.08 and 50001)

This inspection focused on the Unit 1 steam generator replacement activities (e.g., nondestructive examinations (NDE) and welding activities).

Part a. in Section 02.03, “Steam Generator Removal and Replacement Inspections,” of IP 50001 requires review and inspection of the following four welding and nondestructive examination (NDE) activities:

02.03.a.1: Where applicable, special procedures for welding and NDE,

02.03.a.2: Training and qualifications for personnel performing welding and NDE,

02.03.a.3: NDE including radiography results and work packages for selected welds, and

02.03.a.4: Completion of preservice NDE requirements for welds and completion of baseline eddy-currrent examination of new steam generator tubes.

a. Inspection Scope

For each of the welding and NDE activities observed and reviewed, the inspectors verified that the specific welding procedure specifications and NDE procedures met the applicable American Society of Mechanical Engineers (ASME) Code requirements.

The inspectors verified, by review, that the welding procedure specifications and the welders had been properly qualified in accordance with ASME Code, Section IX, requirements. The inspectors also verified, through observation and record review, that essential variables for the gas tungsten arc welding process (machine and manual) and

the shielded metal arc welding process had been identified, recorded in the procedure qualification record, and formed the bases for qualification of the welding procedure specifications.

During review of each NDE, the inspectors verified that appropriate NDE procedures were used; that examinations and conditions were as specified in the procedure; and that test instrumentation or equipment were properly calibrated and within the allowable calibration period. The inspectors also verified the NDE certifications of the personnel who performed the observed NDE examinations.

Finally, the inspectors reviewed the baseline eddy current report as documented in "Assessment of Steam Generator Tube Degradation Mechanisms Recommended Preservice Inspection, Testing, and Repair Scope U1R12." The baseline eddy current tests included 100 percent bobbin coil injection, as well as plus point coil inspection of the following: 100 percent of the hot leg top of tube sheet, U-bend Rows 1-3, all dents, and all bobbin I codes.

Documents reviewed by the inspectors are listed in the attachment.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

**Risk Assessment and Management of Risk**

The inspectors reviewed the below listed assessment activities to verify: (1) performance of risk assessments when required by 10 CFR 50.65(a)(4) and licensee procedures prior to changes in plant configuration for maintenance activities and plant operations; (2) the accuracy, adequacy, and completeness of the information considered in the risk assessment; (3) that the licensee recognizes, and/or enters as applicable, the appropriate licensee-established risk category according to the risk assessment results and licensee procedures; and (4) the licensee identified and corrected problems related to maintenance risk assessments.

- September 27, 2005, evaluated controls and plans to minimize any adverse impact on Units 2 and 3 and common systems

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)

The inspectors reviewed evaluations of changes, tests, or experiments associated with the steam generator replacement modifications. This review was documented in NRC Integrated Inspection Report 05000528; 05000529; 05000530/2005002.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors selected the four below listed postmaintenance test activities of risk significant systems or components. For each item, the inspectors: (1) reviewed the applicable licensing basis and/or design-basis documents to determine the safety functions; (2) evaluated the safety functions that may have been affected by the maintenance activity; and (3) reviewed the test procedure to ensure it adequately tested the safety function that may have been affected. The inspectors either witnessed or reviewed test data to verify that acceptance criteria were met, plant impacts were evaluated, test equipment was calibrated, procedures were followed, jumpers were properly controlled, the test data results were complete and accurate, the test equipment was removed, the system was properly re-aligned, and deficiencies during testing were documented.

- December 21, 2005, Unit 1, retest per Procedure 72TI-9RC02, "Reactor Coolant System Flow Verification Following Steam Generator Replacement," Revision 1
- December 20-21, 2005, Unit 1, retest per Procedure 40TI-9ZZ05, "SGRP, Steady State Vibration Test," Revision 2A
- December 21, 2005, Unit 1, retest per Procedure 73TI-9RC03, "Reactor Coolant System Heat Loss Measurement Following Steam Generator Replacement," Revision 2
- December 20-22, 2005, Unit 1, retest per Procedure 40TI-9ZZ06, "SGRP, Steam Generator Blowdown Flow Test," Revision 2

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed four samples.

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed the following risk significant refueling items or outage activities to verify defense in depth commensurate with the outage risk control plan, compliance

with the Technical Specifications (TSs), and adherence to commitments in response to Generic Letter 88-17, "Loss of Decay Heat Removal:" (1) the risk control plan; (2) tagging/clearance activities; (3) reactor coolant system instrumentation; (4) electrical power; (5) decay heat removal; (6) spent fuel pool cooling; (7) inventory control; (8) reactivity control; (9) containment closure; (10) refueling activities; (11) heatup and cooldown activities; (12) restart activities; and (13) licensee identification and implementation of appropriate corrective actions associated with refueling and outage activities. The inspectors' containment inspections included observations of the containment sump for damage and debris; and supports, braces, and snubbers for evidence of excessive stress, water hammer, or aging.

With the exception of the steam generator outage activities, the remaining activities are documented in NRC Inspection Report 05000528; 05000529; 05000530/2005005.

Documents reviewed by the inspectors are listed in the attachment.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), procedure requirements, and TSs to ensure that the below listed surveillance activity demonstrated that the Structures, Systems, and Components (SSCs) tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the following significant surveillance test attributes were adequate: (1) preconditioning; (2) evaluation of testing impact on the plant; (3) acceptance criteria; (4) test equipment; (5) procedures; (6) jumper/lifted lead controls; (7) test data; (8) testing frequency and method to demonstrate TS operability; (9) test equipment removal; (10) restoration of plant systems; (11) fulfillment of ASME Code requirements; (12) updating of performance indicator data; (13) engineering evaluations, root causes, and bases for returning tested SSCs not meeting the test acceptance criteria were correct; (14) reference setting data; and (15) annunciators and alarms setpoints. The inspectors also verified that the licensee identified and implemented any needed corrective actions associated with the surveillance testing.

- November 26, 2005, Unit 1, Procedure 40TI-9ZZ02, "Steam Generator Spillover Test," Revision 1

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the UFSAR, plant drawings, procedure requirements, and TSs to ensure that the four below listed temporary modifications were properly implemented. The inspectors: (1) verified that the modifications did not have an affect on system operability/availability; (2) verified that the installation was consistent with modification documents; (3) ensured that the post-installation test results were satisfactory and that the impact of the temporary modifications on permanently installed SSCs were supported by the test; (4) verified that the modifications were identified on control room drawings and that appropriate identification tags were placed on the affected drawings; and (5) verified that appropriate safety evaluations were completed. The inspectors verified that the licensee identified and implemented any needed corrective actions associated with temporary modifications.

- October 15, 2005, Unit 1, Temporary Modification 2541314, "Temp Power to Power Panels in Containment"
- October 29, 2005, Unit 1, Design Modification 2665322, "Rework D-Ring and Reactor Cavity Wall"
- November 16, 2005, Unit 1, Design Modification 2541284, "Temporary Lift Device Inside Containment"
- November 28, 2005, Unit 1, Temporary Modification 2717295, "Air, Argon, and Argon Monitoring"

The inspectors completed four samples.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY
Cornerstone: Occupational Radiation Safety

2OS1 Access Control To Radiologically Significant Areas (71121.01)

a. Inspection Scope

This area was inspected to assess the licensee's performance in implementing physical and administrative controls for airborne radioactivity areas, radiation areas, high radiation areas (HRAs), and worker adherence to these controls with respect to the steam generator replacement activities. The inspector used the requirements in 10 CFR Part 20, the TSs, and the licensee's procedures required by TS as criteria for determining compliance. During the inspection, the inspector interviewed the radiation

protection manager, radiation protection supervisors, and radiation workers. The inspector performed independent radiation dose rate measurements and reviewed the following items:

1. Controls (surveys, posting, and barricades) of five radiation, high radiation, and potential airborne radioactivity areas

2. Radiation exposure permit, procedure, and engineering controls and air sampler locations

3. Conformity of electronic personal dosimeter alarm set points with survey indications and plant policy; workers' knowledge of required actions when their electronic personnel dosimeter noticeably malfunctions or alarms

4. Barrier integrity and performance of engineering controls in four potential airborne radioactivity areas

5. Radiation exposure permit briefings and worker instructions

6. Adequacy of radiological controls such as required surveys, radiation protection job coverage, and contamination controls during job performance

7. Dosimetry placement in high radiation work areas with significant dose rate gradients

8. Controls for special areas that have the potential to become very HRAs during certain plant operations

9. Posting and locking of entrances to all accessible high dose rate - HRAs and very HRAs

10. Radiation worker and radiation protection technician performance with respect to radiation protection work requirements

Documents reviewed by the inspectors are listed in the attachment.

The coverage of the full scope of Inspection Procedure 71121.01 is documented in NRC Integrated Inspection Report 05000528; 05000529; 05000530/2005005.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems (71152)

.1 Unit 2 Steam Generator Replacement Lessons Learned Review - Effectiveness of Corrective Actions

a. Inspection Scope

The inspectors reviewed documents associated with the replacement of both steam generators on Unit 2 to determine if the those corrective actions were incorporated into processes, procedures, and work practices for the Unit 1 steam generator replacement activities. Specifically, the inspectors reviewed 27 CRDRs and over 300 items associated with Bechtel's Unit 2 steam generator replacement lessons learned. The inspectors selected the following 5 CRDRs and performed a detailed assessment: 2685303, 2720645, 2577331, 2639721 and 2826313.

The inspectors interviewed plant personnel (craft, supervisors, and managers), attended outage work control meetings, and observed a heavy lift inside the biological shield wall.

b. Assessment

Overall, the inspectors determined that the licensee included corrective actions identified during the previous replacement of Unit 2 steam generators into processes, procedures, and work practices for the Unit 1 steam generator replacement activities. There were instances where the licensee's corrective actions taken for Unit 2 steam generator replacement were not completely thorough.

- For CRDR 2639721, "Unit 2 Steam Generator Support Lever Heavy Load Drop," Condition Report Action Item 2649251 focused on training of contractor crane operators. This corrective action stated in part, "...establish a formal practice of communicating or familiarizing non-PVNGS personnel with operation of the polar cranes for future SG outages." The licensee did perform indoctrination for the non-PVNGS personnel and their attendance was recorded, but there was no lesson plan, outline, or guide that described the training. When asked, the licensee had to verify that all non-PVNGS polar crane operators attended the briefing (compared contractor employee qualification list to briefing record).

- Both CRDRs 2577331 (Unit 2 Replacement Steam Generator (RSG) 1) and 2826313 (Unit 1 RSG 1) described water being found on the primary side of the steam generators after delivery. The licensee identified the cause of the water found in the Unit 2 RSG 1 was a failure of the equipment used for vacuum drying the steam generator tubes. Corrective actions implemented for the Unit 1 RSGs focused on the failure of the vacuum drying equipment. However, over 3000 gallons of water was found in the Unit 1 RSG 1, compared to 100 gallons in Unit 2 RSG 1, indicating that the cause determination for the water found in the Unit 2 RSG might be inadequate. The licensee's root cause determination

continues, and will be completed prior to shipment of the Unit 3 RSGs. The inspectors concurred with the licensee's conclusions that the water remaining in the primary side of the RSGs did not have an adverse corrosion or structural integrity impact.

Documents reviewed by the inspectors are listed in the attachment.

b. Findings

No findings of significance were identified.

.2 Steam Generator Replacement Outage Inspection (50001)

a. Inspection Scope

The inspectors reviewed the daily condition report summaries and nonconformance reports issued during the replacement project for risk-significant issues to see that the licensee was properly implementing the corrective action program. The inspectors verified that the licensee identified, evaluated, corrected, and trended deficiencies in accordance with the program requirements in place at the Palo Verde Nuclear Generating Station. The inspectors also reviewed the licensee's actions to identify and correct lessons learned from the Unit 1 steam generator replacement project.

Documents reviewed by the inspectors are listed in the attachment.

b. Findings

No findings of significance were identified.

.3 Unanalyzed Seismic Configuation on Old Steam Generators

a. Inspection Scope

The inspectors selected CRDR 2838218, "Unit 1 Steam Generator 2 Snubber Reserviors Drained when Snubbers were Required to be Operable," for detailed review. The report was reviewed to ensure that the full extent of the issue was identified and an appropriate evaluation was performed,

Documents reviewed by the inspectors are listed in the attachment.

b. Findings

No findings of significance were identified.

4OA5 Steam Generator Replacement Activities (50001)

.1 Design and Planning Inspections

a. Inspection Scope

The inspectors used the guidance in Inspection Procedure 50001 to perform the following steam generator design and planning inspection activities.

Engineering and Technical Support

Inspections to review engineering and technical support activities were performed prior to, and during, the steam generator replacement outage by resident and regional office-based specialist inspectors. The results of the inspection are documented in Sections 1R17 and 1R23.

Lifting and Rigging

Inspections to review engineering design, modification, and analysis associated with steam generator lifting and rigging activities were performed by resident and regional inspectors.

Security Considerations and Adverse Impact to Other Unit

Inspectors checked for potential adverse impacts to Units 2 and 3, (the nonoutage units) caused by outage activities, equipment configurations, etc., in accordance with Inspection Procedure 50001. The inspectors made frequent observations of security practices to verify that the licensee provided appropriate support for affected vital and protected area barriers during outage activities.

Documents reviewed by the inspectors are listed in the attachment.

b. Findings

No findings of significance were identified.

.2 Steam Generator Removal and Replacement Inspections

a. Inspection Scope

The inspectors used the guidance in Inspection Procedure 50001 to perform the following steam generator removal and replacement inspection activities.

Welding and NDE Activities

An inspection to review welding and NDE activities was performed during the steam generator replacement outage by regional office-based specialist inspectors. The results of the inspection are documented in Sections 1R08 and 1R23.

Lifting and Rigging Activities (50001 and 71111.23)

The inspectors observed and reviewed several activities throughout the outage associated with lifting and rigging. The inspectors observed and reviewed preparations, procedures, crane and rigging inspections, and lay-down areas associated with the following activities:

- Construction of the outside lift system
- Partial bio-wall and interference removal and replacement
- Temporary handling device construction and removal
- Reactor cavity decking construction and removal
- Old steam generator removal
- Onload of new steam generator
- Transport of old steam generator to storage facility

Major Structural Modifications

The inspectors observed the implementation and reviewed documentation related to several structural modifications. The inspectors observed and reviewed the removal and reinstallation of the following structural modifications to support removal and replacement of steam generators (Section 1R23):

- Containment bio-wall removal as interference

- Structural supports for steam generator and all attached piping during all phases of removal and installation of the steam generator

Containment Access and Integrity

This was not applicable to Palo Verde Nuclear Generating Station steam generator replacement. The cutting of the outer containment wall was not necessary.

Outage Operating Conditions

The inspectors used Inspection Procedure 71111.20 to verify proper outage conditions. Section 1R20 records the activities reviewed.

Radiation Protection Controls

An inspection to review radiation protection controls was performed during the steam generator replacement outage by regional office-based specialist inspectors. The results of the inspection are documented in Section 2OS1.

Foreign Materials Control

The inspectors performed frequent observations of the steam generator replacement activities to verify the licensee was implementing proper foreign materials controls. In particular, the inspectors observed controls related to reactor coolant system and secondary side openings.

Temporary Services

The inspectors reviewed the work package and drawings, then observed the installation, use, and removal of temporary services in the containment building during the outage. Instructions for the use and controls for construction power, acetylene, oxygen, and argon were reviewed, and the actual installation of each system was compared to the approved system sketches.

Storage of Old Steam Generators

The inspectors observed the transport and storage of the old steam generator to the onsite storage facility. The radiological safety plans were reviewed.

Documents reviewed by the inspectors are listed in the attachment.

b. Findings

No findings of significance were identified.

.3 Post-installation Verification and Testing Inspection

The inspectors used the guidance in Inspection Procedure 50001 to perform the following post-installation verification and testing inspection activities.

Containment Testing

This was not applicable to Palo Verde Nuclear Generating Station steam generator replacement. The cutting of the outer containment wall was not necessary.

Licensee's Post-installation Inspections and Verifications

The inspectors observed the implementation and reviewed several post-installation surveillances and tests conducted under the licensee's return to service program. Specific items reviewed are documented in Sections 1R19 and 1R22.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings, Including Exit

Exit Meeting Summary

On October 21, 2005, the inspector presented the Access Controls inspection results with respect to the steam generator replacement activities to Mr. J. Levine, Executive Vice President, Generation and other members of his staff who acknowledged the findings. The inspector confirmed that proprietary information was not provided or examined during the inspection.

The inspectors presented the results of the NDE inspection to Mr. D. Mauldin, Vice President, Engineering and Support and other members of licensee management on November 17, 2005. Licensee management acknowledged the inspection findings.

On January 31, 2006, the resident inspectors presented the results of the inspection to Mr. C. Eubanks, Vice President, of Nuclear Operations and other members of his staff who acknowledged the findings presented.

The licensee confirmed that the inspectors retained no proprietary information.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

## KEY POINTS OF CONTACT

Licensee Personnel
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J. Bayless, Engineer, Inservice Inspection
P. Borchert, Director, Work Management
R. Buzard, Senior Consultant, Regulatory Affairs
D. Carnes, Director, Nuclear Assurance
C. Churchman, Director, Engineering
S. Coppock, Department Leader, System Engineering
D. Fan, Department Leader, Design Mechanical Engineering
J. Gaffney, Director, Radiation Protection Department
T. Gray, Department Leader, Technical Services
D. Hanson, Engineer, Inservice Inspection
D. Hautala, Senior Engineer, Regulatory Affairs
J. Hesser, Director, Emergency Services
V. Huntsman, Technical Management Assistant, Radiological Services
J. Levine, Executive Vice-President, Generation
E. O'Neil, Department Leader, Emergency Preparedness
P. Kirker, Unit Department Leader, Operations
D. Marks, Section Leader, Regulatory Affairs - Compliance
D. Mauldin, Vice President, Engineering and Support
M. McGhee, Unit Department Leader, Operations
M. Melton, Section Leader, Inservice Inspection
M. Radsprinner, Section Leader, Systems Engineering
T. Radtke, General Manager, Support
F. Riedel, Director, Nuclear Training Department
J. Scott, Section Leader, Nuclear Assurance
C. Seaman, General Manager, Regulatory Affairs and Performance Improvement
D. Smith, Plant Manager, Operations
M. Sontag, Department Leader, Nuclear Assurance
D. Straka, Senior Consultant, Regulatory Affairs
K. Sweeney, Section Leader, System Engineering
R. Stroud, Senior Consultant, Regulations Affairs
J. Taylor, Department Leader, Operations Support
M. Wagner, Department Leader, Radiation Protection Operations
T. Weber, Section Leader, Regulatory Affairs
C. Zell, Director, Work Management

Other
M. Romond, Project Manager, Bechtel
R. Henry, Site Representative, Salt River Project
E. Shovic, Site Representative, El Paso Electric

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None

## LIST OF DOCUMENTS REVIEWED

In addition to the documents called out in the inspection report, the following documents were selected and reviewed by the inspectors to accomplish the objectives and scope of the inspection and to support any findings:

Section 1R08: Inservice Inspection Activities

Procedures
73TI-9RC01, “Steam Generator Eddy Current Examinations,” Revision 23
73TI-0ZZ13, “Radiographic Examination,” Revision 11

Miscellaneous
Bechtel Special Processes Manual:

Section 2.0 Welding and NDE Matrices
Section 3.0 Procurement and Control of Welding Filler Materials
Section 4.0 Welder Performance Qualification Standards
Section 5.0 General Welding Standards
Section 6.0 Nondestructive Examination Standards
Section 7.0 Post-Weld Heat Treatment Standards
Section 8.0 Weld Documentation Requirements
Section 9.0 Welding Procedure Specifications

Radiographic Examinations

| | | | | |
|---|---|---|---|---|
| RT-05-494 | RT-05-506 | RT-05-509 | RT-05-524 | RT-05-527 |
| RT-05-495 | RT-05-507 | RT-05-512 | RT-05-525 | RT-05-605 |
| RT-05-498 | RT-05-508 | RT-05-516 | RT-05-526 | RT-05-606 |
| RT-05-503 | | | | |

Section 1R13: Maintenance Risk Assessments and Emergent Work Controls

Procedures
40OP-9ZZ16, "RCS Drain Operations," Revision 33
31MT-9ZC07, "Miscellaneous Containment Building Heavy Loads," Revisions 8 and 9
72IC-9RX03, "Core Reloading," Revision 22

Miscellaneous
U1R12 Shutdown Risk Assessment, Revision 0, September 21, 2005
Updated Final Safety Analysis Report, Section 9.1, "Fuel Storage and Handling," Revision 12
NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants"
1R12 Outage Overview Fragnet
Design Inputs Requirement Checklist for DMWO 2541284

Section 1R19: Postmaintenance Testing

Procedures
40DP-9ZZ21, "SGRP Startup Test Controlling Document," Revision 2

40DP-9AP20, "Steam Generator Replacement and Power Uprate Startup Test Program," Revision 0

72TI-9RC03, "Reactor Coolant System Heat Loss Measurement Following Steam Generator Replacement," Revision 2

40DP-9ZZ22, "SGRP Group Mode Change Requirements," Revision 1

Condition Report/Disposition Request (CRDR)
2841777

Section 1R20: Refueling and Other Outage Activities

Procedure
40OP-9PC01, "Fuel Pool Cooling," Revision 5

Miscellaneous
1R12 Refueling Outage Overview
Engineering Design Change 2005-00201

Section 2OS1: Access Control to Radiologically Significant Areas

Procedures
75DP-0RP01, "RP Program Overview," Revision 4
75DP-0RP02, "Radioactive Contamination Control," Revision 6
75DP-0RP04, "Radiological Reports," Revision 6
75DP-9RP01, "Radiation Exposure and Access Control," Revision 6
75RP-9OP02, "Control of Locked HRAs and Very HRAs," Revision 16
75RP-0RP01, "Radiological Posting and Labeling," Revision 20
75RP-9RP02, "Radiation Exposure Permits," Revision 17
75RP-9RP07, "Radiological Surveys and Air Sampling," Revision 11
75RP-9RP10, "Conduct of Radiation Protection Operations," Revision 15
75RP-9RP16, "Special Dosimetry," Revision 10

Radiation Exposure Permits
1-6006A Steam Generator Replacement Primary Side Work
1-6010A Steam Generator Replacement Pipe End Decontamination

CRDRs
2835818, 2636341, 2839056

Section 4OA2: Identification and Resolution of Problems

Procedures
CP-02, “Work Plan and Inspection Record,” Revision 7
31MT-9ZC07, “Miscellaneous Containment Building Heavy Loads,” Revision 20

CRDRs
2577331, 2581735, 2588676, 2622423, 2622952, 2628918, 2639392, 2639400, 2639721, 2639775, 2641213, 2643155, 2643949, 2644885, 2645505, 2645519, 2646116, 2646126, 2646142, 2646227, 2646466, 2646820, 2651352, 2656599, 2685303, 2693949, 2720645, 2826313

Miscellaneous
Unit 2 SGRO Lessons Learned Data Base

Polar Crane Indoctrination Training Attendance List

Sensitive Issues Manual, Revision 11

Nuclear Assurance Evaluation Reports 05-0115, 05-0133, 05-0139, 05-0142, 05-0152, 05-0156, 05-0168, 05-0172, and 05-0181

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Section 4OA5: Steam Generator Replacement Activities

Procedures
40DP-9ZZ17, "Control of Doors, Hatches and Floor Plugs," Revision 28

CRDRs
2831798, 2831540, 2831526, 2839843, 2842906, 2856439

DIWOs
2665322, 2618625

DMWOs
2541316, 2541281, 2541284, 2541292, 2541022, 2541355

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13-SG-346-H-00D, "Pipe Support Assembly SG-02," Revision 0
13-SG-346-H-00E, "Pipe Support Assembly SG-01," Revision 0

Non-Conformance Reports
25030-013, 25030-035, 25030-036, 25030-60

Miscellaneous
Proprietary Calculation CN-CI-05-94, "Evaluation of the PVNGS Unit 1 RCS with Inoperable Snubbers at One Steam Generator during RSG Outage"
Selected Cadweld Tests
Field Change Request 0-361

## LIST OF ACRONYMS

| | |
|---|---|
| ASME | American Society of Mechanical Engineers |
| CRDR | condition report/disposition request |
| HRA | high radiation area |
| NDE | nondestructive examinations |
| NRC | Nuclear Regulatory Commission |
| RSG | replacement steam generator |
| SGRP | Steam Generator Replacement and Power |
| SSC | structures, systems, and components |
| TS | technical specifications |
| UFSAR | updated final safety analysis report |
| WO | work order |