U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No.: 50-528/93-15, 50-529/93-15, and 50-530/93-15

Docket No.: 50-528, 50-529, and 50-530

License No.: NPF-41, NPF-51, and NPF-74

Licensee: Arizona Public Service Company
P. O. Box 53999, Station 9012
Phoenix, AZ 85072-3999

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

Inspected at: Palo Verde Nuclear Generating Station, Wintersburg, Arizona

Inspection date: April 5 through 9, 1993

Inspectors: D. Acker, Reactor Inspector, Region V
S. Sanchez, Intern

Approved by: W. P. Ang — 5-5-93
W. P. Ang, Chief Engineering Section — Date Signed

Inspection Summary:

Inspection during the period April 5 - 9, 1993 (Report Nos. 50-528/93-15, 50-529/93-15 and 50-530/93-15)

Areas Inspected: The inspectors reviewed examples of licensee design changes and temporary modifications in accordance with Inspection Procedure 37700, "Design Changes and Modifications." The inspectors also performed on-site followup of licensee events in accordance with Inspection Procedure 92700, "Onsite follow-up of Written Reports of Nonroutine Events at Power Reactor Facilities," and performed a review of battery maintenance testing in accordance with Inspection Procedure 62705, "Electrical Maintenance (Components and Systems)."

Safety Issues Management System (SIMS) Item:

None

Results:

General Conclusions and Specific Findings:

- Five of six design change packages (DCPs) reviewed met the review criteria.

- One DCP had four problems. These problems were:

  A site drawing affected by the DCP was not identified or updated to show the changes of the DCP.

  An operating procedure affected by the DCP was not identified or updated to show the changes of the DCP.

  The Updated Final Safety Analysis Report, which was affected by the DCP, was not updated.

  The retest was not adequately performed and this problem was not identified during required engineering and supervisory engineering reviews.

- Both temporary modifications reviewed met the review criteria.

- Design change package work observation was satisfactory.

Significant Safety Matters:

None.

Summary of Violation or Deviations:

In the areas inspected two violations were identified:

A. Three separate examples of one violation of Technical Specification 6.8.1 procedural adherence requirements are identified in Section 2.1 of this report.

B. One violation of 10 CFR 50.71 requirements for timeliness of UFSAR changes is identified in Section 2.1 of this report.

Open Items Summary:

Two enforcement items were opened. One followup item was closed.

Details

1. Persons Contacted

Arizona Public Services Company

J. Bailey, Director, Site Technical Support
*T. Bradish, Manager, Nuclear Regulatory Affairs
*C. Clapper, Supervisor, Performance Engineering
*G. D'Aunoy, Principal Engineer, Quality Assurance and Monitoring
*J. Dennis, Manager, Operations Standards
*R. Flood, Plant Manager, Unit 2
*D. Kanitz, Nuclear Regulatory Affairs
*S. Kesler, Acting Manager, Nuclear Engineering, Electrical
*R. Fullmer, Manager, Quality Assurance and Monitoring
*G. Overbeck, Director, Nuclear Engineering
*C. Russo, Manager, Quality Control
*J. Sears, Senior Quality Engineer
*M. Webszyn, Auditor, Quality Assurance and Monitoring

Others

*R. Henry, Salt River Project Site Representative
*J. Draper, Southern California Edison Site Representative

U. S. Nuclear Regulatory Commission

*J. Sloan, Senior Resident Inspector
*A. MacDougall, Resident Inspector

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

*Denotes those attending the exit meeting on April 9, 1993.

2. Design Control (37700)

2.1 Design Changes

The inspectors selected for review six design change packages (DCPs) which were determined by the licensee as not requiring NRC approval. The inspectors reviewed the DCPs for conformance with Technical Specifications, 10 CFR 50.59, the licensee's Quality Assurance program, and 10 CFR Part 50, Appendix B, Criterion III, "Design Control."

The inspectors reviewed the following three DCPs for approval authority, procedure control, proper testing criteria, proper licensee updating of operating procedures and training, as built drawing control, proper safety evaluations, proper licensee updating of maintenance procedures, and control and update of the Updated Final Safety Analysis Report (UFSAR):

- DCP 2XE-SG-163, "Main Steam Isolation Valve Control Console Power"

- DCP 2XE-QB-011, "Rewire Essen [Essential] and Emer [Emergency] LT [Lighting] Ckts [Circuits] in Safe Shutdown Areas"

- DCP 3PE-ZC-194, "Personnel Air Locks - Addition of Redundant Overcurrent Protection (Fuses + Hardware) to Enhance Circuit Fault Withstand Integrity"

The inspectors chose DCP 2XE-SG-163 for review because the change was being made as the result of an individual plant examination (IPE) which indicated that the change would provide a significant safety improvement. The inspectors chose DCP 2XE-QB-011 for review because of the history of problems with safe shutdown lighting at Palo Verde. The inspectors chose DCP 3PE-ZC-194 for review because it involved improvements to containment integrity.

The inspectors also determined that the licensee had recently been performing a number of motor operated valve (MOV) wiring changes and mechanical snubber reduction changes using the DCP process. Due to the large number of changes being made with MOV wiring and mechanical snubbers, the inspectors decided to perform partial reviews of the following DCPs.

- DCP 1FJ-CP-028, "Reserve an Individual Rotor for Torque Switch Bypass"

- DCP 1FJ-HP-044, "Reserve an Individual Rotor for Torque Switch Bypass"

- DCP 3FC-SI-185, "Reduction of Mechanical Snubbers on Safety Injection System Safety Injection Tank"

The following paragraphs contain the inspectors' observations and findings for DCP 2XE-SG-163. The inspectors concluded that the other five DCPs reviewed met the review criteria.

2.1.1 As-Built Drawings

Design Change Package 2XE-SG-163 changed the routing of 125 volt direct current (DC) power to the main steam isolation valves (MSIVs), added an alternate power source, and added an alarm circuit to an existing control room annunciator. The alarm circuit provided the control room with an alarm for loss of power to the MSIVs.

The inspectors determined that the DCP included changes to vendor drawings and identified site drawings which required updating. However, the inspectors determined that 125 volt DC site drawing, 02-E-PKB-001, "Elementary Diagram, 125V DC Class 1E Power System," which covered 125 volt DC alarm circuit wiring was not identified for update in the DCP. The inspectors reviewed the drawing and determined that it did not show the wiring for the new alarm circuit. The inspectors provided this information to the licensee,

who reviewed the DCP and agreed that drawing 02-E-PKB-001 was required to be changed. The licensee agreed to change the drawing.

The inspectors noted that Palo Verde Nuclear Administrative and Technical Manual (NATM) Procedure 81AC-0DC01, Revision 04.03, "Procedure for Design Changes," Section 3.2.3.d stated, "Design...output (e.g., drawings, databases) documents affected by the design modification and the required changes shall be prepared or identified as part of the design change package."

Failure of the licensee to update drawing 02-E-PKB-001 is one example of a violation of Technical Specification 6.8.1 procedure adherence requirements (NOV 50-529/93-15-01).

2.1.2 Operating Procedures

The inspectors determined that the licensee identified procedure changes required for DCPs through a process called Impact Review. The inspectors reviewed the Impact Review documentation associated with DCP 2XE-SG-163 and determined that not all of the procedures requiring updating had been identified and updated. DCP 2XE-SG-163 added a loss of MSIV 125 volt DC voltage alarm to an existing annunciator alarm. However, the associated alarm response procedure, NATM Procedure 42AL-2RK1A, "Panel B01A Alarm Response," was not identified, recorded, statused, or updated as part of the DCP. The inspectors provided this information to the licensee. The licensee agreed that NATM Procedure 42AL-2RK1A required changing and committed to make the change.

Palo Verde NATM Procedure 81AC-0DC01, Section 3.2.6 stated that, "Documents, processes, training, etc., affected by the design modification...shall be identified, recorded, statused, and updated...."

Failure of the licensee to update Procedure 42AL-2RK1A is another example of a violation of Technical Specification 6.8.1 procedure adherence requirements (NOV 50-529/93-15-01).

2.1.3 Testing

The inspectors determined that DCP 2XE-SG-163 specified that testing was to be accomplished in accordance with Generic Procedure 70GT-0ZZ01, Revision 1, Preliminary Change Notice 1, "Electrical Circuit Test." Procedure 70GT-0ZZ01 contained general electrical retest requirements with no specific applicability to any DCP.

Performance of 70GT-0ZZ01 was also required by Work Order 519134, for Unit 2, Train A.

Section 7.2 of Procedure 70GT-0ZZ01 required that, "Only Operations/Systems Engineers or Maintenance PC [Planning

Coordinator] shall place N/A's in data sheets where steps are not applicable for required testing."

The inspectors reviewed the copy of Procedure 7OGT-OZZO1 that was completed in accordance with Work Order 519134 and determined that the craft person performing the work had written N/A beside a number of the required test steps. Steps that were NA'd included, ensuring that wiring and components were in accordance with the specified drawings, understanding the circuit logic for the system under test, performance of energized testing and returning circuit breakers to their as found conditions.

The inspectors determined that after the craft person N/A'd understanding the circuit logic, the same craft person initialed verification that the design logic agreed with the as-built conditions and that all circuit devices operated per design.

The inspectors determined that the craft person initialed completion of restoration steps including removal of test equipment, operations notified of completion of testing activities and status of components, and clearances released on November 29, 1991. However, on December 13, 1991, the craft person initialed completion of a step that all annunciator inputs were verified and then noted in the work order continuation sheet that fuse replacement had been required. There was no indication of proper circuit restoration following the work on December 13, 1991.

DCP 2XE-SG-163 provided two sources of 125 volt DC power to MSIVs. The DCP required that the alternate circuit breaker was to be closed prior to opening the normal circuit breaker, thus ensuring uninterrupted power to the MSIVs. The inspectors determined that there was no indication in Procedure 7OGT-OZZO1 for Work Order 519034 that the proper voltage and polarity of the two sources had been verified. The inspectors considered that apparent failure to verify circuit polarities allowed the potential for personnel injury and a plant trip if the two associated circuits breakers were both closed and improper polarity existed.

The inspectors noted that Unit 2 was in a refueling outage, however the inspectors were concerned that the retesting problem discovered for Work Order 519034 could also have occurred in Units 1 and 3. The inspectors provided this concern to the licensee. The licensee immediately reviewed the retesting accomplished for Units 1 and 3 for DCPs 1XE-SG-163 and 3XE-SG-163. The licensee determined that the retest results from Unit 3 showed that circuit voltages and polarities had been properly verified but that the retest from Unit 1 was incomplete. The licensee concluded that the normal supply circuit was correct, based on operating plant indicators. The licensee tagged open the alternate supply circuit breaker in Unit 1 until the circuit could be safely retested.

The licensee also committed to properly test the Unit 2 circuits, prior to Unit 2 startup.

The inspectors concluded that the licensee's immediate corrective actions were adequate.

Failure of the craft personnel to complete the required retest in accordance with Procedure 70GT-0ZZ01 is another example of a violation of Technical Specification 6.8.1 procedure adherence requirements (NOV 50-529/93-15-01).

2.1.4 Update of the Update Final Safety Analysis Report

DCP 2XE-SG-163 included instructions for update of the Updated Final Safety Analysis Report (UFSAR). The inspectors were unable to locate any UFSAR changes associated with this DCP. The inspectors asked the licensee to identify the UFSAR changes associated with this DCP. The licensee reported that the required changes had not been made. The licensee issued a Condition Report Disposition Request (CRDR) to determine the root cause of the failure to update the UFSAR and committed to update the UFSAR.

10 CFR Part 50.71, Records and Reports, states in Section e(4) that, "Subsequent [Updated Final Safety Analysis Report (UFSAR)] revisions must be filed annually or 6 months after each refueling outage.... The revisions must reflect all changes up to a maximum of 6 months prior to the date of filing."

As of April 5, 1993, the Unit 2 UFSAR, Revision 5, dated March 1993, did not include changes required by DCP 2XE-SG-163, which was completed in Unit 2 in December 1991, during the Unit 2 R3 outage. The Unit 2 R3 outage was completed in January 1992. This is a violation of 10 CFR `art 50.71 requirements (NOV 50-529/93-15-02).

2.1.5 Discussion and Conclusion

As noted above, DCP 2XE-SG-163 had four problem areas. These areas included incomplete drawing update, incomplete procedure update, inadequate retest and missing UFSAR update. Although the missed drawing and procedure updates were errors of omission and would normally only be found by a detailed review, the improperly N/Aed retest steps were easily identified by a cursory review. The inspectors noted that a system engineer and two engineering supervisors signed for review of the completed DCP, including retesting.

Based on the inspectors' findings, the licensee issued CRDRs to determine the cause and provide corrective actions for the four problems discussed above. The licensee stated that their corrective actions would include review of the retesting for similar DCPs recently completed to change the 125 volt DC power source to

feedwater isolation valves and DCPs 1XE-SG-163 and 3XE-SG-163 in Units 1 and 3.

The inspectors concluded that the use of generic testing criteria for a retest for DCP 2XE-SG-163 and the failure of engineering personnel to ensure the adequacy of this completed retest was an engineering weakness.

The inspectors also concluded that the licensee's immediate corrective actions and committed actions were adequate.

2.2 Temporary Modifications

The inspectors selected two temporary modifications for review. The inspectors reviewed these modifications for program controls, procedure details, approval responsibility, formal records of the changes, independent verifications of the changes, functional testing, periodic licensee review and adequacy of the design.

The temporary modifications (TMs) reviewed were:

2-91-MT-029, "Eliminate Reactor Trip During Fault Initiated Power Load Imbalance"

1-92-EC-017, "Bypass Motor Module and Discharge Module on Essential Chiller Protective Circuitry to Prevent Board Trips"

Temporary modification 2-91-MT-029 was chosen for review due to the fact that it had been installed for over a year and the significance of a previous overpower event that the modification was designed to prevent in the future.

Temporary modification 1092-EC-017 was chosen for review because it bypassed a normal safety related alarm.

The inspectors determined that TM 2-91-MT-029 met the review criteria.

The inspectors determined that TM 1-92-EC-017 met the review criteria, except for retesting. The TM specified a check of proper essential chiller operation once a shift, however, the method utilized by operations to accomplish the check was general in nature. The inspectors discussed the operational checks with the system engineer, who indicated that quality assurance personnel had previously reviewed this TM and had similar comments. The inspectors checked with the quality assurance personnel and determined that quality assurance personnel had previously obtained a commitment from operations standards personnel to issue a detailed procedure, with acceptance criteria by April 12, 1993. The inspectors concluded that the committed action would ensure proper retesting.

2.3 Design Change Package Work Observation

The inspectors selected one minor design modification in progress for review. The inspectors reviewed this modification for approved instructions, as-built conditions conform to requirements, control of leads lifted, proper testing, compliance with technical specifications, and conformance of the new equipment to design standards.

The inspectors chose DCP 2XE-PK-037, "Replace Class 1E Batteries, Channels B and D," for review due to the safety significance of the station batteries and fact that the work was ongoing during the inspection period.

In addition to document reviews, the inspectors witnessed parts of the installation and filling of the batteries, connection of test equipment and performance of a 18 month battery surveillance test. The inspectors noted that the system engineer was continually monitoring battery installation and testing.

The inspectors determined that DCP 2XE-PK-037 met the review criteria.

Two violations of NRC requirements were identified in the areas reviewed.

3. Electrical Maintenance (62705)

The inspectors reviewed the data from a capacity test of an emergency lighting battery performed in accordance with NATM Procedure 32MT-9QD03, Revision 0, "Exide Control Room Emergency Lighting Battery Capacity Discharge Test." The inspectors reviewed data for battery 1EQDNF01 taken in accordance with Work Order 537189.

Procedure 32MT-9QD03 calculated battery capacity utilizing the time it took the battery under a standard design load to reach a low voltage value. The low voltage value for battery 1EQDNF01 was 105 volts DC. However, during the test, an individual cell of the battery went below an individual cell low voltage condition specified by the procedure and the test was stopped before reaching the 105 volt DC battery voltage. Due to the procedure wording, the craft completed the procedure, and calculated the battery capacity using a formula in the procedure which assumed that 105 volt DC had been reached. The craft recorded that the battery capacity was 97%. Although this number was conservative, it was not correct. After the test, the licensee replaced the cell which had the low voltage.

The inspectors determined that there was no indication in the procedure that engineering personnel had reviewed the procedure and concluded that the test, which was stopped in progress, adequately demonstrated battery capacity. In addition, there was no indication in the procedure that engineering personnel recognized that the 97% capacity value recorded in the procedure was not correct. Performance of emergency lighting battery discharge tests was committed to the NRC in Arizona Public Services Company letter 161-03373-WFC/WFQ dated August 1, 1990.

The inspectors discussed battery 1EQDNF01 capacity testing with the licensee. Licensee engineering personnel indicated that they monitored battery performance as part of their trending program, and that they considered that the test, as performed, adequately demonstrated battery capacity. The licensee documented this conclusion, and provided a copy to the inspectors. The licensee conclusion was based on the fact that the capacity was at least 97%, which was higher than required and the fact that they had charts which showed actual battery performance until the test was suspended. These charts could be used to evaluate changes in battery performance during future tests.

Based on the licensee's documented evaluation, the inspectors concluded that the battery was adequately tested and that sufficient information was available to provide a base for trending battery performance.

No violations or deviations from NRC requirements were identified in the areas reviewed.

4. Onsite Followup of Written Reports (92700)

(Closed) Licensee Event Report 50-528/89-25-L0 and L1: Missing Radiant Energy Barrier

Licensee's Report

On November 3, 1989, the licensee determined that a Unit 1 radiant energy fire barrier was missing from one of the two pressurizer auxiliary spray valves in the pressurizer room. The licensee determined that barrier had been missing for approximately 32 months. The licensee also determined that the missing barrier would have adversely affected the ability to achieve and maintain safe shutdown in the event of a fire.

Licensee's Actions

The licensee replaced the missing barrier. The licensee determined the cause of the missing barrier was failure to update the drawings for the pressurizer auxiliary spray valve when the design change which added the barrier was accomplished.

Due to this report and other reports concerning design document deficiencies with fire barrier material, the licensee committed to walkdown all fire barriers to ensure that the as-built conditions matched design drawing criteria. This action was taken in conjunction with Licensee Event Report (LER) 529/90-009.

Inspectors' Actions During the Present Inspection

The inspectors noted that LER 529/90-009 was closed by Inspection Report 50-528, 50-529, 50-530/93-09. The inspectors reviewed the licensee's corrective actions and the updated drawings.

Discussion and Conclusion

Based on the inspectors satisfactory review of the updated drawings and the completion of long range corrective actions associated with LER 529/90-009, the inspectors concluded that this item was adequately resolved. This item is closed.

No violations or deviations from NRC requirements were identified in the areas reviewed.

5. Exit Meeting

The inspectors conducted an exit meeting on April 9, 1993, with members of the licensee staff as indicated in Section 1. During this meeting, the inspector summarized the scope of the inspection activities and reviewed the inspection findings as described in this report. The licensee acknowledged the concerns identified in the report.