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

September 15, 2003

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 TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000528/2003-007; 05000529/2003-007; 05000530/2003-007

Dear Mr. Overbeck:

On June 27, 2003, the U. S. Nuclear Regulatory Commission (NRC) completed a 2-week onsite team triennial fire protection baseline inspection of your Palo Verde Nuclear Generating Station, Units 1, 2, and 3. Additional in-office inspection was performed during the weeks of June 16, July 7, July 21, and August 4, 2003. The enclosed report presents the results of this inspection. We discussed the preliminary results of the onsite inspection with you and members of your staff on June 27, 2003. On August 20, 2003, we conducted a telephonic exit meeting with you and members of your staff to inform you of the results of the inspection.

The inspection involved an examination of the effectiveness of activities conducted under your license as they related to the implementation of your NRC-approved fire protection program and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, no findings of significance were identified. However, a licensee-identified violation, which was determined to be of very low safety significance, is discussed in Section 4OA7. If you contest the violation or significance of the noncited violation, 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.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be 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/

Rebecca L. Nease, Team Leader
Engineering and Maintenance Branch
Division of Reactor Safety

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

Enclosure:
NRC Inspection Report
05000528/2003-007; 05000529/2003-007; 05000530/2003-007

cc w/enclosure:
Steve Olea
Arizona Corporation Commission
1200 W. Washington Street
Phoenix, Arizona 85007

Douglas K. Porter, Senior Counsel
Southern California Edison Company
Law Department, Generation Resources
P.O. Box 800
Rosemead, California 91770

Chairman
Maricopa County Board of Supervisors
301 W. Jefferson, 10th Floor
Phoenix, Arizona 85003

Aubrey V. Godwin, Director
Arizona Radiation Regulatory Agency
4814 South 40 Street
Phoenix, Arizona 85040

Craig K. Seaman, Director
Regulatory Affairs/Nuclear Assurance
Palo Verde Nuclear Generating Station
Mail Station 7636
P.O. Box 52034
Phoenix, Arizona 85072-2034

Hector R. Puente
Vice President, Power Generation
El Paso Electric Company
2702 N. Third Street, Suite 3040
Phoenix, Arizona 85004

Terry Bassham, Esq.
General Counsel
El Paso Electric Company
123 W. Mills
El Paso, Texas 79901

John W. Schumann
Los Angeles Department of Water & Power
Southern California Public Power Authority
P.O. Box 51111, Room 1255-C
Los Angeles, California 90051-0100

John Taylor
Public Service Company of New Mexico
2401 Aztec NE, MS Z110
Albuquerque, New Mexico 87107-4224

Jarlath Curran
Southern California Edison Company
5000 Pacific Coast Hwy. Bldg. DIN
San Clemente, California 92672

Robert Henry
Salt River Project
6504 East Thomas Road
Scottsdale, Arizona 85251

Brian Almon
Public Utility Commission
William B. Travis Building
P.O. Box 13326
1701 North Congress Avenue
Austin, Texas 78701-3326

Electronic distribution by RIV:
Acting Regional Administrator **(TPG)**
DRP Director **(ATH)**
Acting DRS Director **(CSM)**
Senior Resident Inspector **(NLS)**
Branch Chief, DRP/D **(LJS)**
Senior Project Engineer, DRP/D **(JAC)**
Staff Chief, DRP/TSS **(PHH)**
RITS Coordinator **(NBH)**
Mel Fields **(MBF1)**
PV Site Secretary **(vacant)**
DAPowers (DAP)

ADAMS: ✓ Yes ☐ No Initials: _____
✓ Publicly Available ☐ Non-Publicly Available ☐ Sensitive ✓ Non-Sensitive

SRI:EMB	SRI:EMB	RI:EMB	RI:EMB	TL:EMB	C:PBD	C:TL:EMB
CEJohnson/lmb	RPMullikin	JMateychick	JTaylor	RLNease	LJSmith	RLNease
/RA/	/RA/	/RA/	/RA/	/**RA**/	/**RA**/	/**RA**/
08/22/03	08/20/03	08/21/03	08/20/03	08/09/03	09/09/03	09/15/03

OFFICIAL RECORD COPY T=Telephone E=E-mail F=Fax

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos.:	50-528; 50-529; 50-530
License Nos.:	NPF-41; NPF-51; NPF-74
Report No.:	05000528/2003-007; 05000529/2003-007; 05000530/2003-007
Licensee:	Arizona Public Service Company
Facility:	Palo Verde Nuclear Generating Station, Units 1, 2, and 3
Location:	5951 S. Wintersburg Road Tonopah, Arizona
Dates:	June 9-27, 2003; additional in-office inspection was conducted during the weeks of July 7, July 21, August 4, and a telephonic exit meeting was conducted August 20, 2003
Team Leader:	C. E. Johnson, Senior Reactor Inspector Engineering and Maintenance Branch
Inspectors:	R. P. Mullikin, Senior Reactor Inspector Engineering and Maintenance Branch
	J. Mateychick, Reactor Inspector Engineering and Maintenance Branch
	J. Taylor, Reactor Inspector Engineering and Maintenance Branch
Accompanying Personnel:	S. Meyers, Engineering Associate A. Kana, Engineering Associate
Approved By:	Rebecca L. Nease, Team Leader Engineering and Maintenance Branch Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000528/2003-007, IR 05000529/2003-007, IR 05000530/2003-007; 06/9-27/2003; 07/7-11/2003; 07/21-25/2003; 8/4-20/2003; Palo Verde Nuclear Generating Station, Units 1, 2, and 3; Triennial Fire Protection Inspection.

The inspection was conducted by a team of four regional inspectors and accompanied by two engineering associates. The inspection identified one (Green) finding, which was a violation of NRC regulatory requirements. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violation

Violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking numbers are listed in Section 4OA7 of this report.

- License Conditions 2.C(6), 2.C(7) and 2.F (Units 1, 2, and 3, respectively), require the licensee to implement and maintain all provisions of their approved fire protection program as described in the Updated Final Safety Analysis Report for the facility. In Section 9.5.1.1 of the Updated Safety Analysis Report the licensee committed to Branch Technical Position 9.5-1, "Guidelines For Fire Protection For Nuclear Power Plants." Branch Technical Position 9.5-1 states that measures should be established to assure that conditions adverse to fire protection, such as, failures, malfunctions, deficiencies, deviations, defective components, uncontrolled combustible material and nonconformances are promptly identified, reported ,and corrected. Contrary to the above, from September 1997 to the present, a condition adverse to fire protection was identified, but not corrected in order to prevent recurrence. The plant maintenance radio system used for alternative shutdown outside of the control room included a design feature, which adversely impacted the availability and reliability of the system when security performed radio checks. The licensee's failure to correct the ongoing deficiency with the plant maintenance radio system resulted in periods of time where the requirements of 10 CFR Part 50, Appendix R, Section III.L, were not met. Specifically, disruption of communications to operations via the radio system could prevent the completion of operator actions for an alternative shutdown outside the control room. The failure to correct and prevent recurrence of these deficiencies was identified in the licensee's corrective action program as Condition Report/Disposition

Request 2589540. This finding was of very low significance because the probability of the disruption of the operations radio communications as a result of security radio checks and a fire occurring concurrently is very low.

Report Details

1. REACTOR SAFETY

Cornerstones: Initiating Events and Mitigating Systems

1R05 Fire Protection

The purpose of this inspection was to review the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, fire protection program for selected risk-significant fire areas. Emphasis was placed on verification of the licensee's post-fire safe shutdown capability. The inspection was performed in accordance with the new NRC regulatory oversight process using a risk-informed approach for selecting the fire areas and attributes to be inspected. The team leader and a Region IV senior reactor analyst used the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, Individual Plant Examination for External Events (IPEEE) to choose several risk-significant areas for detailed inspection and review. The fire zones chosen for review during this inspection were:

- Fire Zone 5B (Train B engineered safety feature switchgear room)
- Fire Zone 7B (Channel B dc equipment room)
- Fire Zone 47A (Channel A containment electrical penetration room)
- Fire Zone 42D (Auxiliary Building 100' west corridor area)

For each of these fire zones, the inspection was focused on the fire protection features, the systems and equipment necessary to achieve and maintain safe shutdown conditions, determination of license commitments, and changes to the fire protection program. The primary inspection focus was on Unit 1. However, any differences between the units were considered in the review. The team also toured and inspected several of the same fire areas in Units 2 and 3.

.1 Systems Required to Achieve and Maintain Post-Fire Safe Shutdown

a. Inspection Scope

The team reviewed the functional requirements identified by the licensee as necessary for achieving and maintaining hot shutdown conditions to ensure that at least one post-fire safe shutdown success path was available in the event of a fire in each of the selected areas. The team reviewed piping and instrumentation diagrams of systems credited in accomplishing safe shutdown functions to independently verify whether the licensee's shutdown methodology had properly identified the required components. The team focused on the following functions that must be ensured to achieve and maintain post-fire safe shutdown conditions:

- Reactivity control capable of achieving and maintaining cold shutdown reactivity conditions,

- Reactor coolant makeup capable of maintaining the reactor coolant inventory,

- Reactor heat removal capable of achieving and maintaining decay heat removal, and

- Supporting systems capable of providing all other services necessary to permit extended operation of equipment necessary to achieve and maintain hot shutdown conditions.

A review was also conducted to ensure that all required electrical components in the selected systems were included in the licensee's safe shutdown analysis. The team identified the systems required for each of the primary safety functions necessary to shut down the reactor. These systems were then evaluated to identify the systems that interfaced with the fire areas inspected and were the most risk significant systems required for reaching both hot and cold shutdown conditions. The systems selected for review were the chemical and volume control system, reactor coolant system, and the safety injection system.

b. Findings

No findings of significance were identified.

.2 Fire Protection of Safe Shutdown Capability and Post-fire Safe Shutdown Circuit Analysis

a. Inspection Scope

The team reviewed licensee documentation to verify that at least one post-fire safe shutdown success path was free of fire damage in the event of a fire in the selected fire areas. Specifically, the team examined the separation of safe shutdown cables, equipment, and components within the same fire areas. The team reviewed, on a sample basis, the analysis of electrical protective devices (e.g., circuit breakers, fuses, relays), coordination, and adequacy of electrical protection provided for nonessential cables, which share a common enclosure (e.g., cable trays) with cables of equipment required to achieve and maintain safe shutdown conditions. Additionally, the team reviewed the protection of diagnostic instrumentation required for safe shutdown for fires in the selected areas. A sample of fire barrier penetration seals in the selected fire areas was reviewed by the team. The team reviewed the licensee's methodology for meeting the requirements of 10 CFR 50.48, and the bases for the NRC's acceptance of this methodology as documented in NRC safety evaluation reports. In addition, the team reviewed license documentation, such as, the Palo Verde Updated Final Safety Evaluation Report, submittals made to the NRC by the licensee in support of the NRC's review of their fire protection program, and deviations from NRC regulations to verify that the licensee met license commitments.

The team reviewed a comprehensive list of design changes that resulted in removal of Thermo-Lag fire barriers, focusing on instances where manual actions were substituted in lieu of installing another fire barrier.

b. Findings

Manual Actions in Lieu of Physical Protection Requirements

Introduction: The team identified an unresolved item concerning the use of manual actions for a fire outside of the control room. These manual actions were used in lieu of physical protection of equipment required for post-fire safe shutdown, and some of these actions did not appear to be approved by the NRC. This issue is unresolved pending further NRC review of the licensee's fire protection program licensing basis regarding the use of manual actions.

Description: In reviewing Procedure 40DP-9ZZ19, "Operational Considerations due to Plant Fire," and Calculation 13-MC-FP-316, "Appendix R Manual Action Feasibility," the team found that in the event of a fire in numerous fire areas outside of the control room, the licensee credited the use of manual actions in lieu of providing physical protection of equipment required for post-fire safe shutdown. Many of these manual actions were found to have been submitted to the NRC and approved in the Updated Final Safety Analysis Report, Safety Evaluation Report, Supplement 7, dated December 1984. However, the team could not verify that all manual actions taken in lieu of providing the required physical protection were formally submitted to and approved by the NRC. For example, one action is to align the refueling water tank as an alternate suction path to the charging pumps in order to prevent gas binding. The team could not verify that this manual action had been approved by the NRC.

The team reviewed the manual actions credited in the event of a fire in the selected fire areas, and found that all were described in procedures and appeared to be reasonable and feasible.

Analysis: The significance of this issue will be evaluated if the team determines that any manual actions credited for post-fire safe shutdown were not submitted and approved by the NRC. This item is unresolved pending completion of further NRC review of the licensee's fire protection licensing basis.

Enforcement: License Conditions 2.C(6), 2.C(7) and 2.F (Units 1, 2, and 3, respectively), require the licensee to implement and maintain all provisions of their approved fire protection program as described in the Updated Final Safety Analysis Report for the facility. In the Updated Final Safety Analysis Report, the licensee committed to 10 CFR Part 50, Appendix R, Section III.G, III.J, and III.O. Section III.G.2 of Appendix R to 10 CFR Part 50 describes three methods acceptable for ensuring that at least one train of redundant safe shutdown equipment is free of fire damage: (a) redundant trains be located in different fire areas separated by 3-hour rated fire barriers; (b) redundant trains in the same fire area be separated by 20 feet of horizontal distance with no intervening combustible or fire hazards, and the fire area be equipped with area-wide detection and suppression; or (c) one redundant train be separated from the other redundant trains by enclosing it in a 1-hour fire-rated barrier, and the fire area be equipped with area-wide detection and suppression. However, the licensee credited operator actions in lieu of providing the physical protection requirements of Section III.G.2. The NRC will perform further review of the licensing basis documents to determine whether all manual actions credited in lieu of the physical protection specified

in Appendix R, Section III.G 2, were submitted to and approved by the NRC. Whether this issue is a violation remains unresolved pending completion of this review (URI 05000528; -529; -530/2003007-01).

.3 Alternative Safe Shutdown Capability and Implementation

a. Inspection Scope

The team reviewed the licensee's alternative shutdown methodology to determine if the licensee has properly identified the components and systems necessary to achieve and maintain safe shutdown conditions from the remote shutdown panel and alternative shutdown locations for a fire in the unit's control room. The team focused on the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring and support system functions. The team verified that hot and cold shutdown from outside the control room can be achieved and maintained with off-site power available or not available. The team verified that the transfer of control from the control room to the alternative locations has been demonstrated and not affected by fire-induced circuit faults by reviewing the provision of separate fuses for alternative shutdown control circuits.

b. Findings

No findings of significance were identified.

.4 Operational Implementation of Alternate Shutdown Capability

a. Inspection Scope

The team verified that the training program for licensed and non-licensed personnel has been expanded to include the alternative safe shutdown capability through review of sample "Job Performance Measure" packages used for operator training evaluations and operator training lesson plans.

The team performed walkdowns of the actions defined in Procedure 40AO-9ZZ19 with licensed and non-licensed operators. Procedure 40AO-9ZZ19, "Control Room Fire," provides instructions for performing an alternative shutdown from the remote shutdown panel and for manipulating equipment locally in the plant. The team verified that operators could reasonably be expected to perform the procedure actions within the identified applicable plant shutdown time requirements, and that equipment labeling was consistent with the procedure. Also, the team verified that the licensee had adequate staffing for performing Procedure 40AO-9ZZ19.

The team reviewed the results of several completed Surveillance Test Packages 40ST 9ZZ20 performed for Units 1 and 3. The testing is required to be performed every 18 months in accordance with Technical Specifications Surveillance Requirement 3.3.11.2. The review verified that: (1) the licensee conducted periodic operational tests of the alternative shutdown transfer capability and instrumentation and control functions; and (2) the tests were adequate to show that if called upon, the alternative shutdown capability would be functional upon transfer.

The team's review of the adequacy of communications and emergency lighting associated with this procedure are documented in Sections .5, .6, and 4AO7 of this report.

b. Findings

No findings of significance were identified.

.5 Communications

a. Inspection Scope

The team reviewed the communications required to implement the alternative shutdown Procedure 40AO-9ZZ19, "Control Room Fire." The plant maintenance radio system is used by operations to perform an alternative shutdown outside of the control room. The team verified that: (1) the design of the radio system will assure that damage from a control room fire will not impact the performance of the rest of the system; and (2) the radio system is sufficient to perform the required communications identified in the alternative shutdown procedure.

b. Findings

A licensee-identified finding involving timely disposition of emergency communication deficiencies is discussed in Section 4OA7 of this report.

.6 Emergency Lighting

a. Inspection Scope

The team reviewed the adequacy of emergency lighting for performing actions required in Procedure 40AO-9ZZ19, "Control Room Fire," which included access and egress routes. The team reviewed test procedures and test data to verify that the fluorescent lights powered by inverters and 8-hour batteries and the individual battery operated units were able to supply light for the required 8-hour period.

b. Findings

No findings of significance were identified.

.7 Cold Shutdown Repairs

a. Inspection Scope

The team reviewed equipment operations and capability to determine if any repairs were required in order to achieve cold shutdown. The team noted that the licensee did not require the repair of equipment to reach cold shutdown based on the safe shutdown methodology implemented.

b. Findings

No findings of significance were identified.

.8 Compensatory Measures

a. Inspection Scope

The team verified, by sampling, that adequate compensatory measures were put in place by the licensee for out-of-service, degraded, or inoperable fire protection features and post-fire safe shutdown equipment, and systems.

b. Findings

No findings of significance were identified.

.9 Fire Protection Systems, Features and Equipment

a. Inspection Scope

For the selected fire areas, the team evaluated the adequacy of fire protection features (e.g., detection and suppression systems, or passive fire barrier features), such as, fire suppression and detection systems, fire area barriers, penetration seals, and fire doors. The team observed the material condition and configuration of the installed fire detection and suppression systems, fire barriers, and construction details and supporting fire tests for the installed fire barriers. In addition, the team reviewed license documentation, such as NRC safety evaluation reports and deviations from NRC regulations and the National Fire Protection Association (NFPA) codes to verify that fire protection features met license commitments.

The team noted that all four of the fire zones selected contained fire detection systems. Two of the fire zones contained automatic pre-action water sprinkler systems and one fire zone contained an automatic carbon dioxide total flooding system. The team walked down the areas to verify that the detection and suppression system location drawings agreed with the as-installed configurations. The team reviewed the original suppression systems specifications, the hydraulic calculations for the pre-action water systems, and the carbon dioxide system design calculations. The team reviewed the periodic testing performed on the automatic carbon dioxide total flooding system including the interfacing fire detection systems and ventilation system dampers. The team also reviewed the original testing performed to confirm that the design concentration of carbon dioxide was sufficient.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

a. Inspection Scope

The team selected a sample of the licensee's condition reports/disposition requests associated with the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, fire protection program. The team verified that the licensee had an appropriate threshold for identifying issues. The team also reviewed several licensee audits performed for the fire protection program. The team evaluated the effectiveness of the corrective actions for the identified issues.

b. Findings

No findings of significance were identified. A licensee-identified finding involving the timely resolution of emergency communications deficiencies is discussed in Section 4OA7 of this report.

4OA6 Meetings, including Exit

On June 27, 2003, at the conclusion of the team's onsite inspection, the team leader debriefed Gregg R. Overbeck, Senior Vice President, Nuclear, and other licensee management and staff members on the triennial fire protection inspection results.

On July 22, 2003, the team leader and other members of the inspection team conducted an telephonic conference call with the licensee's regulatory affairs and fire protection staff (at the licensee's request) to discuss additional information forwarded to the team and to clarify the basis for the inspection findings.

On August 6, 2003, the team leader, accompanied by the Engineering and Maintenance Branch Chief, conducted an additional onsite meeting to give the licensee an opportunity to clarify and present new information to support their position on an issue pertaining to the location of fire detectors in Fire Zone 7B. At the conclusion of this meeting the team leader informed the licensee that the team would review the additional information provided.

On August 20, 2003, the team leader conducted an telephonic exit with licensee management and staff members on the triennial fire protection inspection results.

The licensee was asked whether any materials examined during the inspection should be considered proprietary. A proprietary document was identified and the inspectors agreed to properly dispose of the document immediately.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) is identified by the licensee and is a violation of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a noncited violation.

- License Conditions 2.C(6), 2.C(7) and 2.F (Units 1, 2, and 3, respectively), require the licensee to implement and maintain all provisions of their approved fire protection program as described in the Updated Final Safety Analysis Report for the facility. In Section 9.5.1.1 of the Updated Safety Analysis Report the licensee committed to Branch Technical Position 9.5-1, "Guidelines For Fire Protection For Nuclear Power Plants." Branch Technical Position 9.5-1 states that measures should be established to assure that conditions adverse to fire protection, such as, failures, malfunctions, deficiencies, deviations, defective components, uncontrolled combustible material and nonconformances are promptly identified, reported ,and corrected. Contrary to the above, from September 1997 to the present, a condition adverse to fire protection was identified, but not corrected in order to prevent recurrence. The plant maintenance radio system used for alternative shutdown outside of the control room included a design feature, which adversely impacted the availability and reliability of the system when security performed radio checks. The licensee's failure to correct the ongoing deficiency with the plant maintenance radio system resulted in periods of time where the requirements of 10 CFR Part 50, Appendix R, Section III.L, were not met. Specifically, disruption of communications to operations via the radio system could prevent the completion of operator actions for an alternative shutdown outside the control room. The failure to correct and prevent recurrence of these deficiencies was identified in the licensee's corrective action program as Condition Report/Disposition Request 2589540. This finding was of very low significance because the probability of the disruption of the operations radio communications as a result of security radio checks and a fire occurring concurrently is very low.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

D. Agazzi, Captain, Fire Department
S. Bauer, Department Lead, Regulatory Affairs
M. Czarnylas, Fire Protection Operations
S. Dodd, Fire Marshal, Fire Department
C. Foster, Senior Engineer, Design Engineering - Mechanical
E. Garcia, Program Advisor, Emergency Service Department
F. Garrett, Management Technical Assistant
R. Guron, Senior Engineer, Mechanical Design
D. Hautala, Senior Engineer, Regulatory Affairs
M. Hodge, Section Leader, Mechanical Design
A. Huttie, Department Leader, Emergency Services Division - Programs
D. Kanitz, Senior Engineer, Regulatory Affairs
S. Kesler, Section Leader, Electrical Design
S. Koski, Fire Protection System Engineer, System Engineering
A. Krainik, Director, Regulatory Affairs
J. Levine, Executive Vice President, Generation
D. Marks, Section Leader, Nuclear Regulatory Affairs - Compliance
R. Merryman, Senior Advisor, Operations
F. Rieder, Department Lead, Nuclear Training Department
G. Overbeck, Senior Vice President, Nuclear
E. Sterling, Department Lead, Nuclear Assurance Department
M. Sontag, Department Lead, Nuclear Assurance Department
D. Straka, Senior Consultant, Regulatory Affairs

Others

R. Henry, Site Representative (Salt River Project)

NRC

N. Salgado, Senior Resident Inspector

LIST OF ITEMS OPENED

Opened

05000528, -529, -530/2003007-01	URI	Manual actions taken in lieu of providing physical protection

LIST OF DOCUMENTS REVIEWED

Calculations

Number	Description	Revision
01-10407-M650-717	Hydraulic Calculations for Bid Item 38 S.W. Corridor 100' Level Zone 42D System Demand 209.5 GPM @ 74.94 PSI Pre-action System	4
01-10407-M650-733	Hydraulic Calculations for Auxiliary Bldg. 120' Level W. Half Channel "A" - Penetration Room	3
01-MC-FP-818	Fire Water System Analysis For Unit 1	2
13-104-07-M652-19	Hazard Effective Discharge Period, Design Flow Rate and Storage Requirement	4
13-104-07-M652-99	Hazard Effective Discharge Period, Design Flow Rate and Storage Requirement	2
13-MC-FP-205	Verification of CO2 Requirement	1
13-EC-FP-110	Protective Device Coordination - Fire Protection	10
13-MC-FP-315	10CFR50 Appendix R Safe Shutdown	9
13-MC-FP-316	10CFR50 Appendix R - Manual Action Feasibility	10
13-MC-FP-317	10CFR50 Appendix R Operational Considerations	6
13-MC-FP-318	III.G/III.L Compliance Assessment	8
13-MC-FP-803	Combustible Loading Calculations	12

Drawings

Number	Title	Revision
01-E-AFB-003 Sheet 1	Elementary Diagram - AFW System AF Reg Valves Pump B to SG-1 & 2, 1J-AFB-HV-30	8
01-E-AFB-003 Sheet 2	Elementary Diagram - AFW System AF Reg Valves Pump B to SG-1 & 2, 1J-AFB-HV-31	8
01-E-CHB-048 Sheet 1	Elementary Diagram - CVCS Seal Inj. Vvs. To RCP 1J-CHE-FV-241	3
01-E-CHB-048 Sheet 2	Elementary Diagram - CVCS Seal Inj. Vvs. To RCP 1J-CHE-FV-242	3

Number	Title	Revision
01-E-CHB-048 Sheet 3	Elementary Diagram - CVCS Seal Inj. Vvs. To RCP 1J-CHE-FV-243	3
01-E-CHB-048 Sheet 4	Elementary Diagram - CVCS Seal Inj. Vvs. To RCP 1J-CHE-FV-244	3
01-E-CHB-073	Elementary Diagram - CVCS Regen. HX to Chg Line Vv. 1J-CHE-HV-239	3
01-E-CHB-052	Elementary Diagram - CVCS Regen. HX to Chg Line Vv. 1J-CHE-HV-240	5
01-E-ECB-003	EchilledW Chilled Water Circ. Pumps & Thermocouples	6
01-E-ECB-004 Sheet 1	Elementary Diagram - EchilledW Chilled Water Expansion Tk. Make-up Vv. 1J-ECA-LV-15	5
01-E-ECB-004 Sheet 2	Elementary Diagram - EchilledW Chilled Water Expansion Tk. Make-up Vv. 1J-ECA-LV-16	5
01-E-EWB-001 Sheets 1 & 2	Elementary Diagram - ECLgW Pumps A & B, 1M-EWA-P01 & 1M-EWB-P01	6
01-E-EWB-002, Sheet 1	Elementary Diagram - ECLgW Surge Tank Fill Vv. 1J-EWA-LV-91	4
01-E-EWB-002, Sheet 2	Elementary Diagram - ECLgW Surge Tank Fill Vv. 1J-EWA-LV-92	4
01-E-EWB-003 Sheet 1	Elementary Diagram - ECLgW Loop A to .from NCW Cross Tie Vv. IJ-EWA-UV-145	5
01-E-EWB-003 Sheet 2	Elementary Diagram - ECLg W Loop A to .from NCW Cross Tie Vv. IJ-EWA-UV-65	5
01-E-EWE-054 Sheet 1	Instrument Loop Wiring Diagram ECLgW	9
01-E-EWE-054 Sheet 2	Instrument Loop Wiring Diagram ECLgW	9
01-E-SIB-001 Sheet 1	Elementary Diagram - Safety Injection & Shutdown Clg Sys HP Safety Injection Pump 1M-SIA-P02	6
01-E-SIB-001 Sheet 2	Elementary Diagram - Safety Injection & Shutdown Clg Sys HP Safety Injection Pump 1M-SIB-P02	6
01-E-SIB-003 Sheets 1 & 2	Elementary Diagram - Safety Injection & Shutdown Cooling System - Containment Spray Pump 1M-SIB-P03	8

Number	Title	Revision
01-E-SIB-020 Sheet 1	Elementary Diagram - Safety Injection & Shutdown Cooling System - Containment Spray Control Valve 1J-SIB-UV-671	5
01-E-SIB-020 Sheet 2	Elementary Diagram - Safety Injection & Shutdown Cooling System - Containment Spray Control Valve 1J-SIB-UV-672	5
01-J-AFE-056	Instrument Loop Wiring Diagram Auxiliary Feedwater System	3
01-J-AFE-058, Sheets 1 & 2	Instrument Loop Wiring Diagram Auxiliary Feedwater System	5
01-J-CHE-0A8 Sheets 1 - 4	Instrument Loop Wiring Diagram CVCS	2
01-J-HJE-051	Instrument Loop Wiring Diagram Control Bldg HVAC	5
01-J-RCE-064 Sheets 1, 2 & 3	Instrument Loop Wiring Diagram Auxiliary Reactor Coolant System	8
01-J-RCE-074 Sheet 1	Instrument Loop Wiring Diagram Auxiliary Reactor Coolant System	7
01-J-RCE-075 Sheet 1	Instrument Loop Wiring Diagram Auxiliary Reactor Coolant System	10
01-J-SGE-060 Sheets 1 & 2	Instrument Loop Wiring Diagram Main Steam System	6
01-J-SGE-061 Sheets 1 & 2	Instrument Loop Wiring Diagram Main Steam System	7
01-J-SGE-064 Sheet 1	Instrument Loop Wiring Diagram Main Steam	6
01-J-SGE-065 Sheet 1	Instrument Loop Wiring Diagram Main Steam System	7
02-E-ZPL-001 Sheet 1 of 2	Power Block Safe Shutdown Emergency Lighting Sheet 1	14
02-E-ZPL-001 Sheet 2 of 2	Power Block Safe Shutdown Emergency Lighting Sheet 1	14
02-E-ZPL-002	Power Block Safe Shutdown Emergency Lighting Sheet 2	14
02-E-ZPL-003 Sheet 1 of 2	Power Block Safe Shutdown Emergency Lighting Sheet 3	7

Number	Title	Revision
02-E-ZPL-003 Sheet 2 of 2	Power Block Safe Shutdown Emergency Lighting Sheet 3	7
02-M-AFP-001	P & I Diagram Auxiliary - Feedwater	24
02-M-CHP-001	P & I Diagram - Chemical & Volume Control System	25
02-M-CHP-002 Sheet 1	P & I Diagram - Chemical & Volume Control System	39
02-M-CHP-003	P & I Diagram - Chemical & Volume Control System	29
02-M-RCP-001	P & I Diagram - Reactor Coolant System	25
02-M-RCP-002	P & I Diagram - Reactor Coolant System	11
02-M-SGP-001	P & I Diagram - Main Steam System	52
02-M-SGP-002	P & I Diagram - Main Steam System	32
02-M-SIP-001	P & I Diagram - Safety Injection and Shutdown Cooling System	23
02-M-SIP-002	P & I Diagram - Safety Injection and Shutdown Cooling System	21
02-10407-M650-416	Auxiliary Building Channel “A” Cable Trays 120' Elevation West Half	9
02-10407-M650-418	Auxiliary Building Channel “A” Cable Trays 120' Elevation West Half Piping & Detector Wire	11
02-10407-M650-445	Water Spray System Aux. Bldg. 100' Level Corridor Zone 42D	8
02-10407-M650-446	Auxiliary Building 100' Level Corridor Zone 42D Detectors	8
13-M-FPZ-001	Appendix R Logic/Safety Function Diagram Legend/Index	1
13-M-FPZ-002	Appendix R Safe Shutdown Logic Diagram	2
13-M-FPZ-003	Appendix R Safety Function Diagram Auxiliary Feedwater System	2
13-M-FPZ-004	Appendix R Safety Function Diagram Auxiliary Building HVAC	1
13-M-FPZ-005	Appendix R Safety Function Diagram Chemical & Volume Control System	3

Number	Title	Revision
13-M-FPZ-006	Appendix R Safety Function Diagram Condensate Storage And Transfer System	0
13-M-FPZ-007	Appendix R Safety Function Diagram Control Building HVAC Sheets 1 and 2	1
13-M-FPZ-008 Sheet 1 of 2	Appendix R Safety Function Diagram Diesel Generator ‘A’	2
13-M-FPZ-008 Sheet 2 of 2	Appendix R Safety Function Diagram Diesel Generator ‘B’	2
13-M-FPZ-009	Appendix R Safety Function Diagram Diesel Fuel Oil And Transfer System	0
13-M-FPZ-010	Appendix R Safety Function Diagram Diesel Generator Buildings HVAC	0
13-M-FPZ-011	Appendix R Safety Function Diagram Essential Chilled Water System	2
13-M-FPZ-012	Appendix R Safety Function Diagram Essential Cooling Water Systems Trains A & B	2
13-M-FPZ-013	Appendix R Safety Function Diagram Essential Spray Pond System	3
13-M-FPZ-014	Appendix R Safety Function Diagram Main Steam System	3
13-M-FPZ-015	Appendix R Safety Function Diagram Miscellaneous HVAC System	0
13-M-FPZ-016	Appendix R Safety Function Diagram Nuclear Cooling Water System	1
13-M-FPZ-017	Appendix R Safety Function Diagram Nuclear Sampling System/Neutron Monitoring System	1
13-M-FPZ-018	Appendix R Safety Function Diagram Electrical Power Distribution	3
13-M-FPZ-019	Appendix R Safety Function Diagram Reactor Coolant System	3
13-M-FPZ-020	Appendix R Safety Function Diagram Safety Injection and Shutdown Cooling	3
13-M-FPZ-021	Appendix R ESFAS Logic Diagram	1
13-10407-M651-1	Detectors Connections Legend - Typical	3

Number	Title	Revision
13-10407-M651-4	Fire Detector System - System “B” Detector Location-Zones 6-13	8
13-10407-M651-12	Detector Locations - System “H” Zones 45 & 46	7
13-10407-M652-44	Low Pressure CO2 Fire Extinguishing System Schematic Arrangement	8
13-10407-M652-45	Low Pressure CO2 Fire Extinguishing System Schematic Arrangement	6
13-10407-M652-46	Low Pressure CO2 Fire Extinguishing System Schematic Arrangement	7
13-10407-M652-59	Low Pressure CO2 Fire Extinguishing System Schematic Arrangement	12

Modifications

Number	Title
DM 00831872	Modification of AFW Valves Fuse Deficiencies
DM 2386948	Correction of false start problems with Emergency fire pumps
254612	DG Stator Heaters Cable Fuse Modification

Cable Routing Data

Component ID	Component Description
1J-AFA-FI-40A	Train A Auxiliary Feedwater (AFW) to Steam Generators Flow Indication
1J-AFB-FI-41A	Train B AFW to Steam Generators Flow Indication
1J-AFA-SI-52A	Train A Essential Steam Driven AFW Pump Turbine Speed Indication
1J-RCA-LI-110X	Train A Pressurizer Level Indication
1J-RCB-LI-110Y	Train B Pressurizer Level Indication
1J-RCA-PI-102A	Train A Pressurizer Pressure Indication
1J-RCB-PI-102B	Train B Pressurizer Pressure Indication
1J-SGA-PI-1013A	Train A Steam Generator 1Pressure Indication

Component ID	Component Description
1J-SGB-PI-1013B	Train B Steam Generator 1 Pressure Indication
1J-SGA-LI-1113A	Train A Steam Generator Wide Range Pressure Indication
1J-SGB-LI-1113B	Train B Steam Generator Wide Range Pressure Indication
1J-SGA-LI-1023A	Train A Steam Generator 2 Pressure Indication
1J-SGB-PI-1023B	Train B Steam Generator 2 Pressure Indication

Condition Reports/Deposition Requests

115571	118061	2369744	2566468	2605708
115639	118196	2369744	2589540	2615396
115740	118480	2409988	2592678	2615408
115986	118490	2415684	2593290	2615959
115997	118504	2428230	2593673	2616096
116685	118510	2510280	2593708	24985553
117292	2310308	2529113	2597191	34780
117716	2354698			

Work Orders

2393664
2409154
2559531
2590511
2591760
2564727
2582629
2615475

Miscellaneous

Letter dated October 16, 1984, from the Licensee to the NRC. Subject: 10 CFR 50, Appendix R Spurious Actuation Analysis

Letter dated November 13, 1984, from the Licensee to the NRC. Subject: 10 CFR 50, Appendix R Spurious Actuation Analysis

Letter dated November 13, 1992, from the NRC to the Licensee. Subject: Summary of Meeting Held on November 10, 1992, to Discuss Fire Protection Programs at Palo Verde

Letter dated April 29, 1993, from the Licensee to the NRC. Subject: 10 CFR 50 Appendix R, New and Revised Deviations

Letter dated July 27, 1993, from the NRC to the Licensee. Subject: Summary of Meeting Held on July 20, 1993, to Discuss the Appendix R Reevaluation Effort

Letter dated September 2, 1994, from the NRC to the Licensee. Subject: Summary of Meeting Held on July 27, 1994, to Discuss Fire Protection Issues

Letter dated March 27, 1997, from the NRC to the Licensee. Subject: Summary of Meeting Held on February 19, 1997, to Discuss Thermo-Lag Issues

Letter dated June 11, 1998, from the NRC to the Licensee. Subject: Completion of Licensing Actions for Generic Letter 92-08, "Thermo-Lag 330-1 Fire Barriers," Dated December 17, 1992

Nuclear Assurance Division Audit 2001-005,"Fire Protection Program," issued July 18, 2001

Nuclear Assurance Division Audit Number 2003-004, "Fire Protection," issued April 25, 2003

Operations Training Department Simulator Scenario "RS005 'A' DG, SGTR," dated April 14, 2000

Operations Training Department Classroom Lesson "Fire Protection Response," Dated May 1, 2001

Operations Training Department Simulator Scenario "SCN - 10 Transformer Fire," Dated February 14, 2003

Operations Training Department Simulator Scenario, "Appendix R Fire," dated April 4, 2003

Operations Training Department Classroom Lesson "C07 - Appendix R Review," dated April 24, 2003

Pre-Fire Strategies Manual, Revision 14

PVNGS Design Basis Manual, "Fire Protection System," Revision 6

Job Performance Measures

AF003-J-PLT-015	DG003-J-PLT-29	EM001-J-PLT-02	EP017-J-PLN-04
CH009-J-PLT-12	DG008-J-PLT-04	EM004-J-PLT-00	RC004-J-PLT-21
CH011-J-PLT-09	DG009-J-PLT-00	EM-15-J-PLT-00	RC007-J-PLT-16
CH016-J-PLT-05	DG012-J-PLT-00	EP003-J-C/R-15	SG008-J-PLT-12
DG001-J-PLT-01			

Lesson Plans

Number	Description	Revision
NKASMS319A	Control Room Fire	00
NLR03L020100	L01 - Control Room Fire	00
NNR03C0203	AO - Shutdown Outside Control Room and Control Room Fire	00
NNR01T0301	Shutdown Outside Control Room Task Training	00
NNI01C350	Abnormal Operating Procedures For Areas 1 And 2	00
NNI02C350	Abnormal Operating Procedures For Areas 3 And 4	00

Procedures

Number	Description	Revision
14FT-9FP07	CO2 Suppression System Storage Tank Level	3
14FT-9FP08	CO2 Fire Suppression System Functional Test	8
14FT-9FP29	CO2 Fire Suppression System Valve and Test Switch Position Verification	5
33FT-9FP02	CO2 Fire Suppression System Damper Functional Test	5
38FT-9QK14	Fire Detection/Protection System Supervised Circuits Test and Functional Test - Carbon Dioxide Panels	2
40AO-9ZZ19	Control Room Fire	9
40DP-9ZZ19	Operational Considerations due to Plant Fire	10
40ST-9ZZ20	Remote Shutdown Disconnect Switch and Control Circuit Operability	5
73ST-9SG05	ADV Nitrogen Accumulator Drop Test	16
91PE-1FP-03	Carbon Dioxide Flooding Test	0

Miscellaneous Documents

Number	Description	Revision
System Training Manual, Volume 64	Fire Protection and Dectection Systems (FP/QK)	3

Number	Description	Revision
Subcontract No. 13-MM-650	Technical Specification for Fire Protection Sprinkler and Spray System	4
Specification No. 13-MM-652	Technical Requirements for Fire Protection Equipment (CO_2)	4
TS 3.3.11	Remote Shutdown System	117
TRM T3.11.100	Fire Detection Instrumentation	4
TRM T3.11.102	Spray and/or Sprinkler Systems	4
TRM T3.11.103	CO_2 Systems	4
TRM Component List T7.0.100	Remote Shutdown Disconnect Switches	0
TRM Component List T7.0.200	Remote Shutdown Control Circuits	0

Audits/Assessments

2003-004, “Fire Protection”, 4/25/03
2001-005, “Fire Protection Program,” 7/18/01