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 AUTH.NAME AUTHOR AFFILIATION  
 CONWAY,W.F. Arizona Public Service Co. (formerly Arizona Nuclear Power  
 RECIP.NAME RECIPIENT AFFILIATION  
 LIEBERMAN,J. Ofc of Enforcement (Post 870413)

SUBJECT: Responds to NRC 920203 ltr re violations noted in Insps of  
 Licenses NPF-41,NPF-51 & NPF-74 & EA-91-182.Corrective  
 actions:on 920215,listed managers were placed on rotation to  
 provide direct shift observation.

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Arizona Public Service Company

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WILLIAM F. CONWAY  
EXECUTIVE VICE PRESIDENT  
NUCLEAR

212-00965-WFC/RJS

March 2, 1992

Mr. James Lieberman  
Director, Office of Enforcement  
U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

Reference: Letter 212-00963-WFC/RJS, dated February 14, 1992,  
from W. F. Conway, APS, to J. B. Martin, NRC,  
"Interim Response to February 3, 1992, Notice of  
Violation for PVNGS, EA 91-182"

Dear Mr. Lieberman:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)**  
**Units 1, 2, and 3**  
**Docket Nos. STN 50-528/529/530**  
**Response to February 3, 1992, Notice of Violation**  
**and Proposed Civil Penalty for PVNGS, EA 91-182**  
**File: 92-056-026**

Arizona Public Service Company (APS) has reviewed the Notice of Violation and Proposed Imposition of Civil Penalty (EA 91-182) transmitted by letter dated February 3, 1992. Pursuant to the provisions of 10 CFR 2.201, APS' responses to the violations described in EA 91-182 are attached.

As indicated in the referenced letter, significant management attention is being devoted to addressing the root causes of these violations and related issues which have arisen during recent months at PVNGS. Attachment 1 to this letter describes the immediate and longer term actions that are being taken on a site wide basis to eliminate the root causes which led to these violations. Several of these actions are already in place or are in the process of being implemented. As noted in Attachment 1, a key element of these actions is the establishment of mechanisms for performance observation and evaluation to assure that the corrective actions are effective.

Attachment 2 provides APS's reply to each of the specific violations and describes the particular corrective actions taken to address each one. APS admits that the violations occurred and is remitting Check No. 50003314 in payment of the proposed civil penalty.

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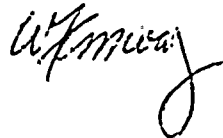
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Mr. James Lieberman  
U. S. Nuclear Regulatory Commission  
Response to February 3, 1992, Notice of Violation  
and Proposed Civil Penalty for PVNGS, EA 91-182  
Page 2

212-00965-WFC/RJS  
March 2, 1992

APS management will closely monitor the implementation and effectiveness of the actions described in this response and will keep the NRC informed. In the meantime, please do not hesitate to contact me should you desire any further information.

Sincerely,



WFC/RJS/rw

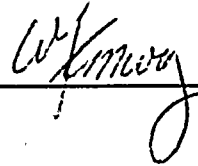
Attachments:

1. Actions to Address Root Causes
2. Restatement of Violations and Reply to Notice of Violation
3. Check No. 50003314 dated February 26, 1992, in the amount of \$162,500.00

cc: Mr. John B. Martin  
Mr. D. H. Coe  
A. C. Gehr  
A. H. Gutterman

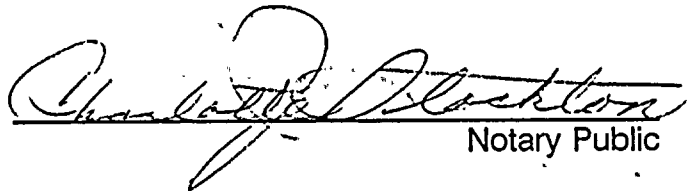
STATE OF ARIZONA       )  
                                  ) ss.  
COUNTY OF MARICOPA   )

I, W. F. Conway, represent that I am Executive Vice President - Nuclear, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true and correct.



W. F. Conway

Sworn To Before Me This 2nd Day Of March 1992.



Notary Public

My Commission Expires

My Commission Expires Mar 13, 1995

**ATTACHMENT 1**

**ACTIONS TO ADDRESS**

**ROOT CAUSES**

## ACTIONS TO ADDRESS ROOT CAUSES

Based upon review of recent NRC violations, selected LERs, and other PVNGS plant information performed to date, the four issues listed below have been determined to be significant root causes of the violations listed in EA 91-182. The corrective actions described below (some of which were initiated prior to the time the potential violations were identified) address each of these root causes.

A more detailed organization and programmatic analysis of recent human errors at PVNGS, including those which resulted in EA 91-182, is currently underway to assure that significant root causes have been identified and that corrective actions sufficient to address these causes and prevent recurrence of similar events are in place. Based on the results of the analysis to date, the areas of Operations, Maintenance, and Site Technical Support have been selected for focused assessment. By May 1992 the final results of this analysis will be available and management will determine whether actions beyond those now planned are warranted.

### A. COMMAND AND CONTROL/SUPERVISORY INVOLVEMENT

1. On Friday, February 7, 1992, management initiated a series of "all hands" briefings which were attended by PVNGS personnel, corporate nuclear staff personnel, and contractor personnel. These briefings, conducted by the PVNGS Vice Presidents of Nuclear Production and Nuclear Engineering, emphasized the seriousness with which management views recent performance issues (including the violations included in EA 91-182), management's commitment to eliminate their causes, and the need for all personnel to support this effort. Management's deep reservations concerning recent performance were made clear as was the fact that this performance does not meet management expectations. The "all hands" briefings were provided to the bulk of PVNGS personnel by February 19, 1992.
2. Beginning on February 15, 1992, the Assistant Plant Manager, the Operations Manager, and the Operations Supervisor for each unit were placed on rotation to provide direct shift observation of the PVNGS operating crews. This rotation has been structured so that all shifts can be observed at different times, including weekends. The individuals performing this oversight have been provided with instructions as to those matters requiring especially close observation and reporting with emphasis on the adequacy of communications, command and control, and adherence to procedures. The shift observation program provides guidance to shift supervisors and reinforcement of management's expectations regarding supervisory performance, and reinforces performance expectations to the operating crews themselves. The Executive Vice President, Nuclear and the

Vice President, Nuclear Production are provided with periodic personal briefings and written reports on these observations. This program will be continued until management is satisfied that it has achieved its objectives.

3. In connection with the current Unit 1 refueling outage, comparable measures to ensure enhanced management oversight have been implemented. Outage tasks of special importance or complexity have been identified, and supervisors or management personnel (in addition to those who would normally be present to observe and help direct these tasks) are providing enhanced management involvement and oversight. Emphasis is being placed on observations which ensure adequacy of preplanning, including establishment of contingency plans and determinations of potential effects on other organizations; designation of a person in charge; proper level of supervisory/management involvement; and communications in accordance with requirements. Lessons learned from this program will be applied to future outages at all three PVNGS units.
4. A program for management observation of maintenance activities has been developed and will be implemented beginning on March 3, 1992. Under this program, maintenance managers and supervisors have been assigned to perform observations of various maintenance work tasks. The observation program assesses maintenance processes, administrative controls, human performance, and the effectiveness of corrective action in achieving improved performance. The managers and supervisors not only act as observers, but actively reinforce management expectations with respect to both work performance and supervision. Individuals performing observations will prepare daily reports to the responsible Maintenance Manager. A weekly summary report of observations will be submitted to the Vice President, Nuclear Production and the Executive Vice President, Nuclear. This program will continue until management is satisfied that expectations are fully understood and are being adhered to by maintenance personnel.
5. Through the observation programs described above and as directed by management, the Positive Discipline process is being consistently used in cases where personnel performance is determined to be a root cause of a performance problem. This process provides a systematic progression of counseling and discipline to individuals responsible for human errors, and also includes positive feedback for superior performance.
6. Operations managers and supervisors have been attending selected simulator training sessions to provide feedback to crews and shift supervisors on the conduct of operations. A major goal of this program has been to provide shift supervisors with guidance and reinforcement on

management expectations regarding the supervision and control of shift operations.

7. The Management Observation Program (MOP) which APS has been using since July 1989 to provide greater management presence in the field is being revised to change its focus from hardware and material condition issues to performance-based observation of activities. Input for this revision includes INPO materials, information on programs in use at other plants, and suggestions from participants in the current program. The revised program is expected to be in place by June 1992.
8. The Maintenance department is preparing a pocket-sized booklet on Principles of Maintenance Management which will be distributed to maintenance supervisors and personnel by May 1, 1992. This booklet will provide a convenient reference readily available to maintenance personnel regarding management expectations on the conduct of maintenance activities. The booklet will cover such topics as personnel safety, procedure adherence, communications, accountability for work quality, and similar matters. Personnel will be briefed on the contents of the booklets at the time they are distributed and new APS and contractor maintenance personnel will be familiarized and provided with the booklet as part of their initial training.

#### B. PROCEDURE ADHERENCE/USE OF PROCEDURES

1. The program for monitoring of operations activities (see A.2 above) includes provisions for assessment of the use and adherence to procedures by Operations personnel both in the control room and in the field. Weekly reports to the Executive Vice President, Nuclear, and the Vice President, Nuclear Production specifically address procedure adherence. Observers have been instructed to reinforce management expectations with respect to procedure adherence by immediately identifying activities that are not in compliance with procedures to the responsible shift supervisor for action. Similar reinforcement and feedback on procedure adherence expectations is being provided during selected simulator training sessions by operations management and supervisory personnel (see A.6 above).
2. The program for observation of maintenance activities (see A.4 above) is designed to review procedure adherence by personnel performing work and to identify and assess any observed instances in which procedures are not followed. Supervisors and managers observing work have been instructed to bring any instances of work that do not conform to procedures to the immediate attention of responsible supervision. This is designed both to correct specific identified problems and to reinforce management



expectations concerning procedure adherence. Procedure adherence problems identified during these observations are also described in the weekly reports provided to the Executive Vice President, Nuclear, and the Vice President, Nuclear Production. The booklet on Principles of Maintenance Management (see A.8 above) also focuses on the necessity for adherence to procedures.

3. A key focus of the revised MOP (see A.7 above) will be observation of activities being conducted pursuant to procedures. Management personnel involved in the program will directly observe procedural adherence in the field and will be responsible for reinforcing expectations and recording observed procedural adherence problems so that they can be evaluated and resolved.

#### C. COMMUNICATIONS

1. The program for observation of maintenance activities (see A.4 above) is designed to assess the effectiveness of communications among Maintenance personnel and between Maintenance and other site groups. In particular, assessments of tailboard meetings and briefings held by maintenance supervisors and foremen during the course of their shifts are being conducted. Identified communications issues in these areas will be made known to responsible supervisors and summarized in the daily and weekly observation reports.
2. The program for observation of Unit 1 outage work (see A.3 above) also includes measures to assure and reinforce good communications. Supervisory and management observers participating in the program have been directed to observe and assess communications related to key tasks, including:
  - coordination among groups responsible for planning and performing work;
  - pre-job and tailboard briefings; and
  - communication within work crews and between supervisors and crews.

Identified communication issues are being made known immediately to responsible supervision.

3. The program for observation of Operations (see A.2 above) activities covers the following aspects of communications:

- Effectiveness of communications among Operations and other organizations (Maintenance, Work Control, Chemistry, Radiation Protection, etc.).
- Assessment of tailboard meetings and briefings held by each operating crew during the course of their shift.
- Assessment of the quality of shift turnover briefings.

Identified communications issues in these areas are made known to responsible supervisors and summarized in the daily and weekly observation reports. In addition, direct reinforcement of communications expectations is provided to shift supervisors and crews by the shift observers.

4. A primary focus of the operations management and supervisory attendance at simulator training sessions (see A.6 above) is to reinforce communications expectations to shift supervisors and crews. Management and supervisory observers of these training sessions are expected to note communications problems and provide feedback and guidance to the crews in which they are observed.

D. ROOT CAUSE ANALYSIS/EFFECTIVENESS OF CORRECTIVE ACTIONS TO ADDRESS ROOT CAUSES

1. As noted above, each of the management observation programs that have been put in place contains mechanisms for reporting of observations and the review of observations by management, including senior management. Management will use these observations as one means for determining whether corrective actions are effective or need to be redirected or supplemented. Problems observed during these efforts are also being entered into the PVNGS condition reporting program for trending purposes.
2. To improve root cause analysis at PVNGS over the long term, and to ensure that the effectiveness of corrective actions is closely monitored and evaluated, selected PVNGS personnel have been trained in organization and programmatic assessment techniques. On a continuous basis, NRC violations, LERs, Corrective Action Requests (CARs), and Condition Report/Disposition Requests (CRDRs) will be analyzed and categorized by cause, organization, and program involved. Based on analysis of this data, causes for adverse performance will be identified, corrective actions will be



determined, and effectiveness of corrective action will be evaluated. This process provides a basis for sustaining improvement over the long term.

3. Since June of 1991, the PVNGS Maintenance Department has put substantial effort into measuring and evaluating Maintenance performance trends. Beginning in June, monthly and quarterly reports have been issued which include data and assessment of the causes of performance trends. Among the items tracked and analyzed are the percent of equipment failures attributable to human error and causes of repeat maintenance (specific causes, including types of human error, are identified and tracked). This data is used by Maintenance management to identify problem areas and select improvement actions. Over the last several months there have been noticeable improving trends relating to the frequency of human errors. Management recognizes that the recent violations indicate the need for further action (described in the sections above), but believes that this systematic approach to performance monitoring and analysis will continue to yield benefits over the long term.

The PVNGS 1992 Business Plan, which defines objectives through 1995, also contains a number of initiatives to improve management and supervisory skills and involvement; work control processes; procedure adherence and quality; communications within and between site organizations; and the quality of performance evaluation and feedback. Because the Business Plan, which is reevaluated and revised on an annual basis, is used to focus management attention and actions, these Business Plan actions should assure that improvements in these areas are sustained over the longer term.

The Executive Vice President, Nuclear, and the Vice President, Nuclear Production are closely monitoring implementation of these broader corrective actions to determine their effectiveness. If the results so warrant, additional actions may be taken to supplement or replace the actions described above.

**ATTACHMENT 2**

**RESTATEMENT OF VIOLATIONS  
AND REPLY TO NOTICE OF VIOLATION  
ENFORCEMENT ACTION (EA) 91-182**

## **RESTATEMENT OF VIOLATIONS**

## RESTATEMENT OF VIOLATIONS

During an NRC inspection conducted between October 27, 1991, through December 2, 1991, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C (1991), the Nuclear Regulatory Commission proposes to impose two civil penalties pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (Act), 42 U.S.C. 2282, and 10 CFR 2.205. The particular violations and associated civil penalties are set forth below:

### I. Violations Assessed a Civil Penalty

- A. Technical Specification 6.8.1 for Palo Verde Units 1, 2, and 3 states that "Written procedures shall be established, implemented, and maintained covering . . . a. The applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978, and those required for implementing the requirements of NUREG-0737."

Regulatory Guide 1.33, Revision 2, Appendix A, Paragraph 9, recommends procedures for performing maintenance that can affect the performance of safety-related equipment.

- i. Procedure No. 30DP-9MP01, Revision 4, dated August 29, 1991, "Conduct of Maintenance," Section 3.5.16, states that "necessary precautions shall be taken whenever work is done, such that the activity . . . will not accidentally damage or remove equipment from service, thus compromising essential plant safety functions." Section 3.5.9 directs that rigging activities be accomplished in accordance with Procedure No. 30AC-0MP13, Section 3.9.6.1, which requires that "When working with or around cranes that are within a boom's length of any power line, an electrical checker shall be required. Ensure that a qualified signalman and checker are stationed at all times within view of the operator to warn him when any part of the machine or its load is approaching the minimum safe clearance."

Contrary to the above, on November 15, 1991, while installing a new electrical bushing on the phase A main transformer, an activity that might compromise the electrical power supply to vital electrical busses, an electrical checker and signalman were not stationed at the work site at all times; other necessary precautions were not taken in that licensee personnel made no allowances for out-of-level conditions, as recommended in the crane vendor's manual; the crew using the crane was required to work without adequate rest and had been awake for approximately 18 of the 26 hours prior to the incident; the work planners were not familiar with the details of the work being

conducted, including the need for a mobile crane; and Amendment A to Work Order No. 526228, controlling the crane job, which designated the Senior Electrician as an independent observer of the job and responsible for the job, was not provided to that individual nor was he otherwise informed of his added responsibilities.

2. Paragraph 5.0 of Procedure No. 30DP-9MP01 references the Palo Verde Accident Prevention Manual. The Accident Prevention Manual, dated January 4, 1990, requires, in Paragraph 29.9(c), that cranes used for work in the vicinity of bare conductors energized at voltages of 600 volts or greater be grounded. This manual further requires, in Paragraph 29.7, that at least 2 feet clearance be maintained between the uninsulated boom section and the 13.8 kV power line energized conductor.

Contrary to the above, on November 15, 1991, the crane used to replace the electrical bushing on the phase A main transformer was not grounded, and the two foot clearance between the uninsulated boom section and the 13.8 Kv power line energized conductor was not maintained.

3. Procedure 40AC-9OP02, "Conduct of Shift Operations," Step 3.2.5.1 states that "formality in communications will be emphasized to reduce operating errors due to assumptions, ambiguous directions, and misunderstandings between operations personnel." Step 3.2.5.2.3 states that "all communications directing or reporting completion of an operating activity must include . . . identification of the originator and intended recipient if other than face to face communication . . . identification of each valve or component . . . [and] acknowledgement of receipt and understanding of direction including as a minimum repeating back each valve or component . . ."

Contrary to the above, on November 15, 1991, operators failed to identify the originators of calls to the control room, failed to ensure correct identification of the overhead power lines being reported as a problem, and failed to acknowledge receipt and understanding of information passed to the control room via telephone. These communication errors caused incorrect action to be taken by control room operators, resulting in the loss of forced circulation in the Unit 3 reactor coolant system.

- B. Technical Specification 6.8.1 for Palo Verde Units 1, 2, and 3 states in part that "Written procedures shall be established, implemented, and maintained covering . . . a. The applicable procedures . . . required for implementing the requirements of NUREG-0737."



NUREG-0737, Section I.C.5, states that the licensee "shall prepare procedures to assure that operating information pertinent to plant safety originating both within and outside the utility organization is continually supplied to operators and other personnel and incorporated into training and retraining programs. These procedures shall clearly identify organizational responsibilities for . . . the feedback of pertinent information to operators and other personnel; and the incorporation of such information into training and retraining programs; . . . provide means to assure that affected personnel become aware of and understand information of sufficient importance that should not wait for emphasis through routine training and retraining programs; . . . [and] identify the administrative and technical review steps necessary in translating recommendations by the operating experience assessment group into plant actions (e.g., changes to procedures; operating orders)."

Procedure No. 95POR-0NS01, Revision 3 (Industry Operating Experience Review Program), dated June 13, 1991, paragraph 2.4, prescribes that Unit Plant Managers and Directors are responsible for ensuring that lessons learned from industry events are effectively incorporated in Palo Verde Nuclear Generating Station (PVNGS) operations.

The NRC advised the licensee of the significant hazards attendant with using mobile lifting equipment in proximity to transmission lines by NRC Information Notice (IN) No. 90-25, dated April 16, 1990, and IN 90-25, Supplement I, dated March 11, 1991, each titled "Loss of Vital AC Power with Subsequent Reactor Coolant System Heat-up." In addition, these hazard potentials were reinforced in a letter from Dr. T. Murley (NRC) to Mr. W. F. Conway (APS), dated March 21, 1991, titled "Operational Events While Shutdown."

Contrary to the above, as of November 15, 1991, the lessons learned from the above formal NRC communications were not effectively incorporated into PVNGS operations, training and procedures to prevent the occurrence at Palo Verde of the type of event described in the NRC communications:

This is a Severity Level III problem (Supplement I).  
Civil Penalty - \$112,500

- C. Unit 2 Technical Specification 6.2.2.d provides that "All CORE ALTERATIONS shall be observed and directly supervised by either a licensed Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling who has no other concurrent responsibilities during this operation."

Technical Specification 3.9.5, applicable during core alterations, provides that "Direct communication shall be maintained between the control room and personnel at the refueling station."



Contrary to the above, on October 27, 1991, with the reactor in Mode 6 (refueling), at approximately 12:10 PM (MST), a core alteration involving withdrawal of the control element assemblies at least one foot from the core into the upper guide structure was conducted without a licensed Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling present and without direct communications established between the control room and personnel at the refueling station.

This is a Severity Level III violation applicable to Unit 2 (Supplement I).  
Civil Penalty - \$50,000

II. Violations Not Assessed a Civil Penalty

- A. Unit 2 Technical Specification 6.8.1 states in part: "Written procedures shall be established, implemented, and maintained covering the activities . . . recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February, 1978" ("Reg. Guide").

Appendix A of Regulatory Guide 1.33 Revision 2 recommends procedures for safe operation and shutdown ("Ops. Procedures").

Procedure 40AC-9OP02, "Conduct of Shift Operations," Step 3.2.1.5, which implements in part the Ops. Procedures recommendation of the Reg. Guide, requires that "Onshift personnel shall be aware of and responsible for plant status . . . They shall be attentive to instrumentation and respond to abnormal indications until corrected or verified to be false by other instrumentation."

Contrary to the above, on October 27, 1991, Unit 2 onshift control room personnel were not attentive to plant instrumentation in that they failed to respond to an abnormal alarm indication caused by the transfer of the PNC-027 bus power supply.

This is a Severity Level IV violation (Supplement I).

- B. Unit 2 Technical Specification 6.8.1 states in part: "Written procedures shall be established, implemented, and maintained covering the activities . . . recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February, 1978" ("Reg. Guide").

Appendix A of Regulatory Guide 1.33 Revision 2 recommends procedures for preparation for refueling and refueling equipment operation.

Procedure 42OP-2ZZ12, "Mode 6 Operations," Step 5.3.15.2, which implements in part the refueling procedures recommendation of the Reg. Guide, provides that, prior to removing the gate between the fuel canal

and the spent fuel pool, the fuel canal and Spent Fuel Pool (SFP) shall be sampled to ensure that adequate boron concentration is maintained.

Contrary to the above, on October 27, 1991, with the reactor in Mode 6, the licensee failed to obtain boron samples of the SFP and the fuel canal prior to opening the gate.

This is a Severity Level IV violation (Supplement I).

- C. Unit 2 Technical Specification 6.8.1 states in part: "Written procedures shall be established, implemented, and maintained covering the activities . . . recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February, 1978" ("Reg. Guide").

Appendix A of Regulatory Guide 1.33 Revision recommends procedures for preparation for refueling and refueling equipment operation ("Refueling Procedures").

Procedure 42OP-2ZZ12, "Mode 6 Operations," Step 5.3.3, which implements in part the Refueling Procedures recommendation of the Reg. Guide, requires that the Refueling Pool be filled between elevation 127 feet 6 inches and 128 feet 6 inches prior to Step 5.3.4, which directs the lowering of the Upper Guide Structure (UGS) lift rig working platform to its lower stop.

Procedure 40AC-9OP02, "Conduct of Shift Operations," Step 3.3.2.1.2, provides that "Procedures shall be completed in the order identified unless deviations are allowed by the procedure or authorized by an approved Special Variance."

Contrary to the above, on October 27, 1991, the Refueling Pool level was less than 127 feet 6 inches when Step 5.3.4 was accomplished to lower the UGS lift rig working platform and a Special Variance had not been authorized.

This is a Severity Level IV violation (Supplement I).

**REPLY TO NOTICE OF VIOLATION**

## REPLY TO NOTICE OF VIOLATION

### VIOLATION I.A.1

APS admits the violation.

### Reason For The Violation

The violation was caused by failures to follow procedures or human performance errors. In addition, management and supervisory involvement in the tasks did not ensure that individuals performing the work followed applicable procedural requirements or work practices.

### Corrective Steps That Have Been Taken And The Results Achieved

The corrective steps that have been taken to address this violation are described in Palo Verde Unit 3 Licensee Event Report (LER) 530/91-010-01, dated January 30, 1992. Additionally, as described in Attachment 1, further actions have been taken or are being taken to ensure that management's expectations for safe operation of PVNGS are fully understood and adhered to by all employees.

**Corrective Steps That Will Be Taken To Avoid Further Violations**

The corrective steps that are being taken to address the specific examples are described in LER 530/91-010-01. Additional actions to address the root causes are described in Attachment 1.

**Date When Full Compliance Will Be Achieved**

APS is currently in compliance.

## VIOLATION I.A.2

APS admits the violation.

### Reason For The Violation

The reason for the violation was personnel error on the part of the crane operator in failing to follow procedures and failing to implement proper crane work practices. In this circumstance, the crane operator did not electrically ground the crane, did not level the crane, left the crane unattended, and did not set the friction brake prior to leaving the crane unattended.

As discussed previously however, APS' investigation concluded that management controls were also not wholly effective. Specifically, the crane operator did not receive a formal pre-job briefing as to the scope of the crane support necessary to perform the work. Also, the crane operator was properly certified in accordance with APS procedures; however, he had not participated in refresher or continuing training for crane operators. Additionally, as discussed in violation I.A.1, a senior electrician designated to act in a supervisory capacity was not at the jobsite at the time of the event.



### **Corrective Steps That Have Been Taken And The Results Achieved**

Specific corrective action for the above examples of improper crane operation are contained in LER 530/91-010-01. Additional corrective actions to ensure management expectations and controls are properly understood and implemented are described in Attachment 1.

### **Corrective Steps That Will Be Taken To Avoid Further Violations**

Corrective actions relating to crane operation and control have been developed and are being implemented as described in LER 530/91-010-01. Attachment 1 contains additional corrective steps to address the management concerns involved in this event.

### **Date When Full Compliance Will Be Achieved**

Full compliance was achieved upon deenergization of the 13.8 kV lines on November 15, 1992.

### **VIOLATION I.A.3**

APS admits the violation.

### **Reason For The Violation**

The reason for the violation was a decision of the shift supervisor to act immediately on information which he believed had been sufficiently verified. This decision was in large part motivated by his concern for personnel safety. Upon receiving a phone call from an unidentified individual that a crane was in contact with the 13.8 kV power lines, the shift supervisor questioned the individual regarding the identification and the physical location of the lines in contact with the crane. Based on his conclusion that the individual was knowledgeable of the correct lines to be de-energized, the shift supervisor decided to de-energize the lines without further verification due to a concern that personnel could be in contact with the crane.

### **Corrective Steps That Have Been Taken And The Results Achieved**

A night order was issued to emphasize the use of appropriate communications formalities between control room personnel and personnel who are not part of the Operations Department.

### **Corrective Steps That Will Be Taken To Avoid Further Violations**

APS recognizes that complete, correct communication is important to plant safety and to mitigating events which may occur. Therefore, enhanced communication training will be developed by June 1, 1992, and will be incorporated into routine training provided to applicable Operations Department personnel. Other actions underway to address proper communications are described in Attachment 1.

### **Date When Full Compliance Will Be Achieved**

Full compliance was achieved on November 15, 1992, when the correct 13.8 kV transmission lines were de-energized.

## **VIOLATION I.B**

APS admits the violation.

### **Reason For The Violation**

APS had performed a review of the administrative controls applicable to equipment operation near sources of power to the units prior to this event and determined that the controls were sufficient or made changes as appropriate. The review was performed based upon the assumption that an equipment operator would be aware of and comply with the procedures, and that pre-job briefings would be held by responsible supervision to include a review of the consequences of improper job performance. The crane operator was not provided sufficient instruction on APS' procedural requirements prior to performing the work, the safety precautions prescribed in APS procedures were not followed, pre-job briefings did not completely address possible crane hazards, and supervisory oversight did not ensure that procedures were followed. As discussed in Violation I.A.1, management and supervisory involvement did not ensure that these activities properly occurred.

### **Corrective Steps That Have Been Taken And The Results Achieved**

The corrective steps that have been taken to address the individual contributors to this event are described in LER 530/91-010-01. Additionally, as described in Attachment 1, APS has taken or is implementing additional actions to ensure that management's expectations for safe operation of PVNGS are met.

### **Corrective Steps That Will Be Taken To Avoid Further Violations**

The corrective steps that are being taken to address management and programmatic concerns are described in Attachment 1. Of particular importance is the enhanced management oversight of daily activities which will be continued until management is satisfied that supervisory personnel fully understand and implement management's performance expectations. Additional actions to ensure that work activities involving equipment operation near sources of power to the units are properly controlled continue to be implemented as described in LER 530/91-010-01.

### **Date When Full Compliance Will Be Achieved**

APS is currently in compliance.

## **VIOLATION I.C**

APS admits the violation.

### **Reason For The Violation**

The reason for the violation was a personnel error by the task leader responsible for the direct supervision of personnel performing the work activities required to remove the Control Element Assemblies (CEAs) during refueling. The task leader did not verify that the assigned refueling senior reactor operator (SRO) was present when directing that the CEAs be lifted a short distance. This is contrary to approved procedural controls.

Also contributing to this event was a failure to ensure that the responsibilities of the individuals in charge of the refueling activities were clearly defined and implemented. The refueling SRO did not attend pre-job briefings and was not aware of the procedural requirements for the work in progress. Also, the refueling SRO was not in close proximity to the task leader and did not take adequate measures to ensure that all core alterations were terminated when the SRO left the containment.

### **Corrective Steps That Have Been Taken And The Results Achieved**

All work was immediately stopped when the task leader realized that the refueling SRO was not present. The Control Room Shift Supervisor suspended core alterations, and the Plant Manager suspended work affecting or involving core alterations until an investigation was completed and appropriate corrective measures were implemented.

Following the investigation, the following actions were taken:

1. The task leader was relieved of his responsibilities.
2. Personnel involved were briefed on this event.
3. A night order was issued to require:
  - a. The refueling SRO and the task leader to be stationed together during core alterations.
  - b. The refueling SRO must give verbal approval each time a new evolution is started.
4. Personnel directly involved in the Unit 2 refueling outage were briefed on this event. The briefings included discussions on the conduct of shift briefs, shift turnover, alarm response, and administrative control requirements.
5. APS procedures for control of refueling activities were revised to provide additional instructions for conduct of pre-job briefings and to clearly define the responsibilities associated with refueling activities.

### **Corrective Steps That Will Be Taken To Avoid Further Violations**

Training will be provided to personnel assigned refueling SRO responsibilities. The training is an overview of refueling activities (excluding fuel movement), the procedures used during refueling, and the responsibilities associated with the refueling SRO position. Personnel assigned refueling SRO responsibilities are now required to review the applicable procedures for activities in progress which may impact core alterations, prior to the time they engage in those activities.

The actions which are being taken to address management and programmatic concerns are described in Attachment 1.

### **Date When Full Compliance Will Be Achieved**

Full compliance was achieved on October 27, 1991, when CEA movement was terminated.



## VIOLATION II.A

APS admits the violation.

### Reason For The Violation

The reason for the violation was a cognitive personnel error by the Unit 2 control room operator responsible for responding to the channel "C" 120-volt AC vital bus "C" inverter trouble alarm.

On October 27, 1991, control element assembly withdrawal was resumed in Unit 2, following the suspension of core alterations described in the above response to Violation I.C. During a subsequent control element assembly withdrawal, the channel "C" 120-volt AC vital bus transferred from the "C" inverter to its voltage regulator. The cause of the bus transferring from the inverter to the voltage regulator could not be determined. The transfer resulted in an alarm and flashing annunciator window in the control room for channel "C" inverter trouble. The trouble alarm was reset, silencing the alarm but leaving the annunciator lit. The cause of the alarm was not immediately investigated, as required by the conduct of shift operations procedure and the alarm response procedure.

A reactor operator on the subsequent shift discovered the channel "C" inverter trouble annunciator still lit. An investigation determined that a Technical Specification ACTION Statement should have been entered.

### **Corrective Steps That Have Been Taken And The Results Achieved**

The channel "C" 120-volt AC vital bus was transferred back to its inverter, exiting the Technical Specification ACTION Statement.

The Vice President, Nuclear Production directed all core alterations and related activities be suspended until an investigation was completed and appropriate corrective actions implemented.

Personnel directly involved in the Unit 2 refueling outage were briefed on this event. The briefings included discussions on the conduct of shift briefs, shift turnover, alarm response, and administrative control requirements.

### **Corrective Steps That Will Be Taken To Avoid Further Violations**

Control Room personnel in Units 1 and 3 are being briefed on this event in accordance with the PVNGS training program. These briefings have been incorporated into the routine training provided to control room personnel and are expected to be completed by April 15, 1992. In addition to the specific actions discussed above, corrective actions associated with the underlying management concerns which became apparent during these events are discussed in Attachment 1.

### **Date When Full Compliance Will Be Achieved**

Full compliance was achieved on October 27, 1991, upon the Unit 2 reactor operator acknowledging and investigating the channel "C" 120-volt AC vital bus "C" inverter trouble annunciator.

## **VIOLATION II.B**

APS admits the violation.

### **Reason For The Violation**

The reason for the violation was a personnel error by a Unit 2 Shift Supervisor signing off an incorrect operations procedure step during refueling operations.

Step 5.3.14 and associated substeps of the Mode 6 operations procedure (42OP-2ZZ12) direct the performer to obtain a boron sample of the Refueling Pool and the Spent Fuel Pool (Substep 5.3.14.3) following the removal of the gate between the Spent Fuel Pool and the Fuel Canal (Substep 5.3.14.2), if valve PCN-V118 was closed during Refueling Pool fill. Substep 5.3.14.1 directs the performer to fill the Fuel Canal. Step 5.3.15 and associated substeps of 42OP-2ZZ12 direct the performer to obtain a boron sample of the Fuel Canal and the Spent Fuel Pool (Substep 5.3.15.2) prior to removing the gate between the Spent Fuel Pool and the Fuel Canal (Substep 5.3.15.3), if valve PCN-V118 was open during Refueling Pool fill. One of the 5.3.14 substeps should be marked "not applicable" during refueling operations.

During refueling operations on October 27, 1991, the Shift Supervisor read step 5.3.14 of 42OP-2ZZ12 and realized that the step did not apply, since valve PCN-V118 was open during the Refueling Pool fill. The Shift Supervisor did not realize this step was conditional to its substeps and consequently signed off step 5.3.14.1, because the Fuel Canal had been filled. Shift turnover began before additional steps of the procedure could be performed. The Shift Supervisor was aware of the need to sample the Spent Fuel Pool and the Fuel Canal; therefore, informed his relief of the need to sample and

instructed the on-shift Chemistry Technician to inform his relief to obtain the required samples. Shift turnover was conducted.

Just prior to the shift briefing, the relieving Shift Supervisor discussed the need to obtain a boron sample of the Spent Fuel Pool with the Chemistry Technicians. The Chemistry Technicians were unable to locate the procedural requirement for the boron sample. The Assistant Shift Supervisor, noting that substep 5.3.14.1 of 42OP-2ZZ12 had been signed off, subsequently authorized removal of the gate between the Spent Fuel Pool and the Fuel Canal (Substep 5.3.14.2). A subsequent review of 42OP-2ZZ12 by the Assistant Shift Supervisor and the Refueling Shift Supervisor revealed that the incorrect substep had been signed off by the previous Shift Supervisor.

#### **Corrective Steps That Have Been Taken And The Results Achieved**

The Assistant Shift Supervisor immediately directed the Chemistry Technicians to sample the Fuel Canal and the Spent Fuel Pool. The boron concentration of the Spent Fuel Pool was above the Technical Specification required minimum limit.

The Shift Supervisor who signed off the incorrect step in 42OP-2ZZ12 and the Assistant Shift Supervisor who authorized removal of the gate between the Spent Fuel Pool and the Fuel Canal were disciplined in accordance with the PVNGS Positive Discipline Program.

Unit 2 operations personnel were briefed on management's expectations regarding conduct of shift briefs, shift turnover, alarm response, and administrative control requirements.



### **Corrective Steps That Will Be Taken To Avoid Further Violations**

In addition to the specific actions discussed above, corrective actions to address the management and programmatic concerns involved in these events are discussed in Attachment 1.

### **Date When Full Compliance Will Be Achieved**

Full compliance was achieved on October 27, 1991, upon obtaining the required boron sample from the Spent Fuel Pool.



## VIOLATION II.C

APS admits the violation.

### Reason For The Violation

The reason for the violation was a failure to ensure that certain requirements applicable to refueling activities in the containment were clearly defined and implemented. Procedure 42OP-2ZZ12, "Mode 6 Operations," provides overall control of the activities being accomplished during refueling. The sequence of relevant refueling activities is basically to lower and engage the Upper Guide Structure (UGS) lift rig onto the UGS, stop and notify the control room (core alterations are completed when the UGS lift rig engaging is complete), raise the Refueling Pool level to between 127' 6" and 128' 6", lower the control element assembly (CEA) support plate, and then latch the CEAs to the lifting rig.

During this process, activities were authorized by the control room to lower and engage the UGS lift rig onto the UGS. This was completed; however, refueling activities continued when the CEA support plate was lowered and the CEAs were latched without cognizant APS supervision authorizing these activities. When the refueling senior reactor operator (SRO) reported to the control room that the CEAs were being latched, control room personnel did not at this point direct that refueling activities be stopped pending investigation into the apparent discrepancy between the reported activities in the containment and the 42OP-2ZZ12 requirements. Subsequently, the control room shift supervisor directed that work in the containment be stopped until a meeting could be held to resolve the apparent discrepancies. Efforts were then taken to place the plant in



a condition which would be in conformance with 42OP-2ZZ12 rather than complete a Special Variance. Thus, a Special Variance was deemed not to be necessary.

#### **Corrective Steps That Have Been Taken And The Results Achieved**

Work was stopped and the Reactor Coolant System (RCS) level was raised to between 127' 6" and 128' 6" pursuant to 42OP-2ZZ12. When the RCS level reached this band, a Special Variance was not required.

Instruction was provided and procedures were revised as appropriate to clearly define the command and control responsibilities associated with refueling activities.

#### **Corrective Steps That Will Be Taken To Avoid Further Violations**

Training will be provided to personnel assigned refueling SRO responsibilities. The training is an overview of refueling activities (excluding fuel movement), the procedures used during refueling, and the responsibilities associated with the refueling SRO position. Personnel assigned refueling SRO responsibilities will be required to review the applicable procedures for activities in progress which may impact core alterations.

The actions which are being taken to address the underlying management and programmatic concerns which became apparent during these events are described in Attachment 1.

#### **Date When Full Compliance Will Be Achieved**

Full compliance was achieved on October 27, 1991, when the proper RCS level was established.

