



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION V

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WALNUT CREEK, CALIFORNIA 94596

September 1, 1989

Docket Nos. 50-528, 50-529 and 50-530  
License Nos. NPF-41, NPF-51 and NPF-74  
EA 89-88

Arizona Nuclear Power Project  
ATTN: Mr. W. F. Conway  
Executive Vice President  
Post Office Box 52034  
Phoenix, Arizona 85072-2034

Gentlemen:

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTY -  
\$250,000 (Inspection Report Nos. 50-528/89-13, 50-529/89-13, and  
50-530/89-13 and Licensee Event Report (LER) 50-530/89-001)

This letter refers to inspections conducted from March 4-31, 1989 concerning events reported by you in the referenced LER, and concerning other activities at your Palo Verde Nuclear Generating Station. The results of these inspections were reported in the referenced NRC inspection reports. Several significant violations of NRC requirements were identified by these inspections. In general, the apparent violations, their causes, and your corrective actions were discussed with you during an NRC/ANPP management meeting held on June 5, 1989.

The specific event this enforcement action centers on is the Unit 3 reactor trip, safety injection, and loss of non-class IE electrical power, which occurred on March 3, 1989. A number of significant system perturbations followed the main generator full load rejection due to the unexplained operation of an electrical protection relay. This load rejection challenged the reactor power cutback and steam bypass control systems (SBCS), which failed to operate properly due to a faulty electronic control system timer card. The SBCS failure resulted in a reactor trip, a main steam isolation valve (MSIV) actuation, a safety injection actuation, and a containment isolation actuation. Electrical power was then completely lost to the non-class IE busses due to the design of the automatic transfer control circuitry of the electrical distribution system.

With the MSIVs closed and power lost to the equipment which supports the operation of the main condenser, the unit operators attempted to establish safe-shutdown decay heat removal by bleeding steam from the steam generators through the atmospheric dump valves (ADVs). The ADVs failed to open when operated from the control room and later when a non-licensed auxiliary operator (AO) attempted to open the valves by using the controls at the remote shutdown panel. AOs were then dispatched to operate the ADVs manually. Although the AOs were eventually able to open two ADVs and thereby commence a controlled removal of decay heat as called for by your emergency operating procedures, their efforts were significantly hampered by inadequate training, poorly written procedures for the manual operation of the ADVs, inadequate lighting

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in the area, difficulty in locating unlabeled valves, and difficulty in communications due to noise in the area. The event was further complicated by numerous other equipment and personnel failures which reflect poorly on the engineering, maintenance, and training programs at Palo Verde, and foremost on the management of the facility. In view of these adverse conditions, we note that the performance of your auxiliary operators in establishing decay heat removal was outstanding.

The operational difficulties encountered with the steam bypass control system (SBCS), the atmospheric dump valves (ADV), and emergency lighting had clear precursors for which you failed to take adequate corrective action. The adverse effects of these system deficiencies were further exacerbated by weaknesses in operator training and inadequate procedures.

The four examples in Violation I.A concern various aspects of ADV reliability and operability. Violation I.A.1 notes that after you experienced significant operational and control problems with the ADVs in 1985, extensive evaluations were performed that identified a number of recommended corrective actions. However, you failed to make use of those actions, many of which would either have led to earlier detection of root causes of the March 3, 1989 ADV malfunction, or prevented the malfunction altogether. Additionally, in 1985, Violation I.A.2 notes that similar operational problems were identified to have occurred with similarly designed valves used in the SBCS. Both your Architect Engineer and NSSS vendor recommended a number of corrective actions (different from those already recommended, as referred to in Violation I.A.1), but you failed to properly evaluate those actions for applicability to the ADVs. Violation I.A.3 identifies an example where a corrective action recommended on October 31, 1987 to install a 3 micron moisture filter on the instrument air lines to prevent moisture induced damage to air operated valve components was not completed for Unit 3 in a timely manner. Lastly, Violation I.A.4 concerns a July 6, 1988 problem with a Unit 1 ADV caused by foreign matter in the actuator air passage ways. Recommended corrective actions, which included inspection and cleaning of the ADV positioners, were not promptly done for the Unit 3 ADVs.

Violation I.B concerns the inadequate corrective action taken after your evaluation of the July 31, 1988 main transformer phase B bushing failure identified a malfunction of the permissive timer for the Group X SBCS valves. No followup was performed at that time to determine the cause of the timer card malfunction. Consequently, the malfunction was repeated during the March 3, 1989 event, and the subsequent SBCS valve cycling caused an excess cooldown that resulted in a low steam generator pressure reactor trip and main steam isolation.

Violation I.C concerns the failure to perform preventive maintenance on the ADVs as recommended by applicable vendor manuals. Your maintenance and engineering programs failed to develop and implement vendor recommended maintenance, despite the historical operability problems encountered with the valves.

Violations II.A.1, 2 and 8 deal with inadequate operator training and inadequate procedures that, together, hindered the operations staff from dealing with the event in a more timely and decisive manner. In Violation II.A.1, an unlicensed auxiliary operator (AO) was assigned to open the ADVs from the remote shutdown panel. At Palo Verde, AOs are not trained to operate the controls at the Remote Shutdown Panel. Violation II.A.2 concerns inadequate non-licensed operator training,



as evidenced by the fact that the 5 AOs on shift at the time of the event had difficulty in manually operating the ADVs. Operation of the ADVs was required by your Emergency Operating Procedures (EOP). Not all of the AOs were trained in the differences in the ADVs, use of the ADVs, nor were any retrained in their use within the last 2 years. Your non-licensed operator training program is significantly deficient in ensuring that AOs are properly trained to take those actions in the field necessary to support accomplishment of EOP directed actions. Violation II.B involved the failure to implement adequate procedures for the manual operation of the ADVs. The procedures posted at the valves lacked the necessary detail to ensure that ADV manual operation could be expeditiously accomplished.

Violations III.A, B, and C concern your emergency lighting system. During the March 3rd event (resulting in a loss of offsite power), there was no lighting available in the upper level of the Main Steam Support Structure (MSSS) when the operators entered one room to operate equipment required by emergency procedures to establish safe shutdown decay heat removal. Your fire protection program, as described in the FSAR, clearly requires emergency lighting in the MSSS, and specifically in the dump valve areas. Manual operation of ADVs presumes adequate lighting to read the procedures for manual ADV operation posted at each ADV. Changes to the program can only be made if they do not adversely affect the ability to achieve and maintain safe shutdown. There is a statement in LER:89-12 (page 2) that the regulations do not require 8-hour emergency lighting in the immediate vicinity of the ADVs, as the ADVs can be operated from either the control room or remote shutdown panel. This contention is unacceptable, as demonstrated by this event. Consequently, your response should address in detail why local operation of the ADVs would not be required to meet the regulations.

Violation III.A addresses the lack of lighting in an area requiring it during an actual emergency. Violation III.B addresses the failure to perform a quarterly walkdown of the emergency lighting system in the MSSS for 5 consecutive quarters, because this requirement was waived by management. Violation III.C notes that the emergency lighting system was not adequately pre-operationally tested to demonstrate that it could meet its design basis, and that the 18 month surveillance tests also did not demonstrate the 8-hour design basis. In sum, these violations demonstrate that the emergency lighting system was not properly installed, tested, or maintained.

Finally, the numerous failures associated with this event are indicative of programmatic problems. We have concluded that these broad based problems should not have existed in the presence of a critical Quality Assurance organization or aggressive oversight groups correctly directed by senior management.

Cumulatively, the violations set forth in the enclosed notice are symptomatic of your failure to establish a working atmosphere which demands that identified plant problems are expeditiously resolved and corrected. Your past actions on these components appear to have been dictated, in large measure, by expediency rather than by thoughtful consideration of standards that are expected to assure reliability and safety.

We recognize your recent efforts to increase the capability of your management team and we further acknowledge the plan you are implementing to improve the overall performance of Palo Verde. However, to clearly emphasize the need to



improve the performance of your engineering, maintenance, and quality organizations, and to set a standard which demands that plant problems be aggressively identified and corrected, I have been authorized, after consultation with the Director, Office of Enforcement, and the Deputy Executive Director for Nuclear Materials Safety, Safeguards, and Operations Support, to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalty in the amount of \$250,000 for the violations described in the enclosed Notice. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C (1989) (Enforcement Policy), the violations described in the enclosed Notice have been categorized in the aggregate as three Severity Level III problems. The base value of a civil penalty for a Severity Level III problem is \$50,000.

The base civil penalty for the first Severity Level III problem (Violations I.A, B and C) has been increased 100% to reflect the added significance resulting from the duration of the violation. The length of time that identified deficiencies were allowed to go uncorrected is an indicator of unacceptable past management performance. No mitigation is appropriate for identification and reporting as the violations became apparent as a result of self-identifying equipment failures for which information relative to the specific deficiencies was previously known. Mitigation for corrective action is also inappropriate because your corrective actions, though eventually extensive, resulted from NRC intervention rather than from self-initiation. Therefore, a civil penalty of \$100,000 is assessed for this Severity Level III problem.

The civil penalty for the second Severity Level III problem (Violations II.A.1, 2, and B) was neither mitigated nor escalated. No mitigation is warranted for identification and reporting, as the operator and operator training issues were identified by the AIT inspection immediately after the event. Although your corrective actions appear reasonably prompt, those actions instituted instructions that should have been in place prior to the event, and therefore no mitigation is warranted. No mitigation or escalation is applied for past performance because you had been rated a SALP 3 in operations based on performance rather than training. No other factors were applicable to this case, and thus a \$50,000 civil penalty is assessed for these violations.

The third Severity Level III problem concerns the inoperability of the emergency lighting system (Violation III.A), the failure to perform required preventive maintenance tasks (Violation III.B) and the failure to adequately test the system after initial installation and periodically thereafter to demonstrate that the system met its design basis requirement (Violation III.C). On numerous past occasions, the NRC has raised concerns regarding various aspects of the emergency lighting system. During a December 1986 management meeting, we discussed with you the ability of the emergency lighting system to provide 8 hours service when powered from batteries. At that time, it was noted that the engineering organization knew of the potential problem following a Unit 2 test in 1985, but due to internal administrative problems, the issue was not addressed. During a February 1987 management meeting, emergency lighting deficiencies were again discussed, including your corrective actions to ensure the existence of adequate preventive maintenance programs to maintain equipment operability. Then, a special evaluation of the emergency lighting system, as followup to LER:87-17, erroneously concluded that the system had been success-



fully tested to meet regulatory requirements. That report also made recommendations for program improvements. Finally, the January 1988 NRC Safety System Functional Inspection raised concerns regarding waiving PMs for the emergency lighting system. This is not an all-inclusive list of emergency lighting concerns documented in NRC inspection reports.

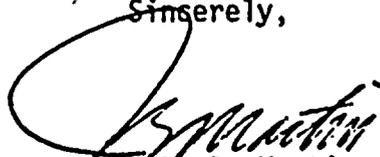
Consequently, the base civil penalty for Violations III A, B, and C was escalated 100%. It was increased 50% because the NRC identified the violations. It was increased another 100% for the added significance resulting from the duration of the violations. However, your corrective actions were extensive and therefore a 50% mitigation factor was applied.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. In your response, you should document the specific actions taken and any additional actions you plan to prevent recurrence. After reviewing your response to this Notice, including your proposed corrective actions and the results of future inspections, the NRC will determine whether further NRC enforcement action is necessary to ensure compliance with NRC regulatory requirements.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

The responses directed by this letter and the enclosed Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, Pub. L. No. 96-511.

Sincerely,



John B. Martin  
Regional Administrator

Enclosure: Notice of Violation and Proposed  
Imposition of Civil Penalty

cc: See Next Page



Arizona Nuclear Power Project ..

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