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WILLIAM F. CONWAY
EXECUTIVE VICE PRESIDENT
NUCLEAR

102-02686/WFC/RAB/SAB
October 11, 1993

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-37
Washington, DC 20555

Dear Sirs:

Subject: **Palo Verde Nuclear Generating Station (PVNGS)**
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Reply to Notice of Violation 50-529/93-29-01
and 50-529/93-29-04
File: 93-070-026

Arizona Public Service Company (APS) has reviewed NRC Inspection Report 50-528/529/530/93-29 and the Notice of Violation dated September 9, 1993. Pursuant to the provisions of 10 CFR 2.201, APS' responses are enclosed. Enclosure 1 to this letter is a restatement of the Notice of Violation. APS' responses are provided in Enclosure 2.

Should you have any questions, please contact Richard A. Bernier at (602) 393-5882.

Sincerely,

WFC/RAB/SAB/bcf

Enclosures:
1. Restatement of Notice of Violation
2. Reply to Notice of Violation

cc: B. H. Faulkenberry
J. A. Sloan

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ENCLOSURE 1

RESTATEMENT OF NOTICE OF VIOLATION 50-529/93-29-01

AND 50-529/93-29-04

NRC INSPECTION CONDUCTED JUNE 21 THROUGH JULY 9, 1993

INSPECTION REPORT NO. 50-528/529/530/93-29

Restatement of Notice of Violation 50-529/93-29-01 and 50-529/93-29-04

During an NRC inspection conducted June 21, 1993 to July 9, 1993, three violations of NRC requirements were identified. One of those violations had been corrected and those corrective actions had been reviewed during and following the inspection. Therefore, no response to that violation is required. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C, the two violations requiring a response are listed below:

A. Violation 50-529/93-29-04 Steam Generator Sample Location

10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," states in part: "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected."

Contrary to the above, despite the licensee Chemistry Manager's receipt of a December 10, 1992 letter from Combustion Engineering identifying the potential for dilution of samples taken from the hot leg blowdown for secondary steam generator water chemistry, a condition adverse to quality, the licensee failed to establish measures to assure that the problem was corrected. Specifically, the licensee did not change the sample location for steam generator secondary water radioactivity measurements from the hot leg blowdown to another location, thus providing inaccurate results.

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

B. Violation 50-529/93-29-01 Radiation Monitoring System

TS 6.8.1 requires procedures to be established, implemented, and maintained as recommended in Appendix A of Regulatory Guide (RG) 1.33, February 1978. RG 1.33, Appendix A, Section 7.g recommends procedures for process radiation monitoring system operation.

Licensee Procedure 74RM-9EF41, "Radiation Monitoring Alarm Response Procedure," requires several operations response actions for "alert" and "high" alarms on RU-15, the waste gas area combined ventilation exhaust monitor. These required responses include acknowledging the alarm, verifying the alarm, informing personnel of possible airborne radiation or contamination hazards, and notifying the effluents group.

Procedure 74RM-9EF41 further requires the Radiation Monitoring System technician to verify the monitor's database for proper setpoints and conversion factors, and then notify the Shift Supervisor.

Licensee Procedure 74RM-9EF42, "Radiation Monitor Alarm Setpoint Determination," requires that changes to the "alert" and "high" alarm setpoints be documented in Appendix J to the procedure and that the basis for the change be documented in Appendix K. The procedure further requires that the basis for the setpoint change be reviewed and approved by the Unit Radiation Protection Manager (RPM) or designee prior to implementation.

Contrary to the above:

1. On May 4, 1993, at 8:50 am, the licensee failed to implement Procedure 74RM-9EF41, in that Unit 2 radiation monitor RU-15 alarmed on both the "alert" and "high" alarms, but operations personnel failed to verify the alarm, inform personnel of possible airborne or contamination hazards, and notify the effluents group.

2. On March 14, 1993, at 4:43 am, the licensee failed to implement Procedure 74RM-9EF41 in that the Unit 2 control room received a main steam line "high" alarm on radiation monitor RU-140, but the Radiation Monitoring System technician did not verify the monitor's database for proper setpoints and conversion factors, and did not notify the Shift Supervisor.

3. On March 14, 1993, at 3:13 am and again at 3:48 am, the licensee failed to implement procedure 74RM-9EF42 in that a Unit 2 Radiation Monitoring System technician changed the "alert" and "high" alarm setpoints on RU-15, but prior to making the changes, failed to perform the following required actions:

    - Obtain the Unit 2 RPM's review and concurrence for the revised setpoint bases.

    - Document the setpoint changes in Appendix J.

    - Document the bases for the setpoint changes in Appendix K.

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

ENCLOSURE 2

REPLY TO NOTICE OF VIOLATION 50-529/93-29-01

AND 50-529/93-29-04

NRC INSPECTION CONDUCTED JUNE 21 THROUGH JULY 9, 1993

INSPECTION REPORT NO. 50-528/529/530/93-29

Reply to Notice of Violation (A) 50-529/93-29-04

Admission or Denial of the Alleged Violation

APS admits the violation.

Reason for the Violation

The reason for the violation was inadequate technical review of Combustion Engineering's (CE) December 10, 1992, letter concerning steam generator (SG) water chemistry sample location recommendations.

During the latter part of 1992, a decision was made to implement molar ratio chemistry control for the SGs. Molar ratio is the ratio of sodium-to-chloride and is a significant indicator of SG crevice chemistry, specifically, crevice pH. Evaluations of SG hot leg empirical data in preparation for actually establishing goals and/or limits for molar ratio chemistry control found that very often, one or both of the constituents (sodium or chloride) would be at levels below detectability. This resulted in essentially meaningless "ratios."

A SG sample point that consistently produced analytical results with higher concentrations than the hot leg sample point was the "downcomer" sample point. Because of its historically higher concentrations, sampling from the downcomer was seen as a possible

solution to improve the molar ratio sensitivity. With that in mind, APS contacted CE for concurrence.

CE responded to this request in the December 10, 1992, letter. CE recommended utilizing the downcomer sample point for routine monitoring and control of SG chemistry.

While the December 10, 1992, CE letter recommended the downcomer sample point be used for chemistry control, APS was not convinced this sample point was the most representative of the bulk water, simply the most sensitive for chemical impurity monitoring. CE's letter stated their suspicions related to the hot leg sample point. The letter mentioned the possibility of dilution of the hot leg sample from economizer feedwater spilling over the divider plate but, in the same sentence, stated that thermohydraulic modeling of the design did not predict it. Additionally, CE stated they considered the downcomer to be representative of the bulk water, but then later went on to explain that this sample point would produce atypical results by stating, "CE recognizes that the typical values that Palo Verde is likely to achieve using this sample location may be different (higher impurity concentrations) as compared to typical samples obtained from other CE and Westinghouse SGs which utilize sample withdrawal from the tubesheet blowdown system."

CE's letter also stated that their recommendations and conclusions were based on a study performed in late 1986, that theorized the difference between the hot leg and

downcomer sample point might be dilution of the hot leg. The same 1986 study suggested that there was a "concentrating effect present in the downcomer."

For these reasons, APS concluded that the higher concentrations of chemical constituents in the downcomer samples were representative of a localized, concentrated point in the SGs but did not accept the CE conclusion that the downcomer was representative of bulk SG water. As such, APS implemented use of the downcomer sample point for molar ratio chemistry control but continued to use the hot leg sample point for radiochemical analyses which resulted in inaccurate primary-to-secondary leak rate calculations.

Corrective Actions Taken and Results Achieved

Procedure 74CH-9XC16, "Sampling and Analytical Schedule," was revised August 27, 1993, to specify the downcomer as the preferred SG sample point.

Following the March 14, 1993, steam generator tube rupture (SGTR) event, a comprehensive investigation of the incident was performed. One facet of the investigation was to re-evaluate the accuracy of the primary-to-secondary leak rate procedure based on the information learned from the SGTR event. This evaluation revealed that the use of the SG radionuclide methodology for calculating primary-to-secondary leak rates was

not accurate because it did not adequately consider such factors as hideout, partitioning factors, plate out, operational lineups, etc. As a result, Procedure 74CH-9ZZ66, "Determination of Primary to Secondary Leak Rate," was revised July 23, 1993, to designate using noble gases in the condenser vacuum exhaust for determining the leak rate. Tritium is used as the backup method.

In addition, Procedure 74DP-9ZZ05, "Abnormal Occurrence Checklist," was revised July 23, 1993, to provide further guidance on primary-to-secondary leaks.

Corrective Actions That Will Be Taken To Avoid Further Violations

No further actions are required.

Date When Full Compliance Will Be Achieved

Full compliance was achieved on August 27, 1993, when Procedure 74CH-9XC16 was revised to specify the downcomer as the preferred sample point.

Admission or Denial of the Alleged Violation

APS admits the violation.

Reason for the Violation

Notice of Violation 93-29-01 cites three examples of failure to follow procedures dealing with the operation of the Radiation Monitoring System (RMS). The reason for each of the examples of failure to follow procedures is as follows:

1) Response to May 4, 1993, alarm on RU-15

On May 4, 1993, when the RU-15 "alert" and "high" alarms were received, a maintenance technician was at the RMS control console in the control room performing quarterly functional checks on RU-143 and -144. The technician informed control room personnel of the presence of the RU-15 alarm and a control room watchstander acknowledged the alarm. However, the control room did not notify the RMS Technician, therefore, the subsequent steps of Procedure

74RM-9EF41 for responding to the alarm were not followed. The reason for not following the procedure was personnel error.

The "high" alarm caused the local alarm for RU-15 to lock in. This alarm went unacknowledged for over 7 hours despite the fact that approximately 200 plant personnel walked past the alarming monitor. An unidentified individual placed tape over the alarm to muffle the sound of the alarm. The corrective actions for this event are thus divided into two groups; those addressing the failure to follow the procedure, and those dealing with the inadequate response to the local alarm.

2) Response to March 14, 1993, alarm on RU-140

When the RMS Technician was responding to the RU-140 alarm on March 14, 1993, he was also assessing approximately 20 other alarms which came in between the time of the SGTR (0434) and the reactor trip (0447). The RMS Technician attempted to contact the Shift Supervisor in accordance with the alarm response procedure but the Shift Supervisor was unable to divert his attention from plant conditions to speak with the technician. The RMS Technician proceeded to evaluate trend data and advised the senior chemistry technician of possible degrading plant conditions. The RMS Technician was aware of the requirements of Procedure 74RM-9EF41 for responding to RMS alarms but made the conscious decision that responding to the numerous alarms and evaluating the

trend information was of a higher priority than verifying the monitor database to ensure the setpoints of the monitors were appropriately set. After a thorough review of these actions during the post-event investigation, APS management concluded that the actions of the technician were appropriate under the circumstances. The reason for the violation was the alarm response procedure does not provide adequate direction or flexibility for significant operational events of this nature.

3) Revision of RU-15 Setpoints on March 14, 1993

Due to gas stripper operations being performed on the morning of March 14, 1993, several alarms were received on RU-15. As a result of these alarms, the RMS Technician raised the alarm setpoint on RU-15 in order to establish an alarm threshold above the occasional alarms resulting from the gas stripper operations. However, the technician failed to follow the procedure requirements for raising the alarm setpoint. The reason for failing to follow the procedure was personnel error.

Corrective Actions Taken and Results Achieved

APS conducted investigations of these incidents and initiated corrective actions for the concerns identified. The corrective actions taken for each of the three examples of the violation are described below:

1) Response to May 4, 1993, alarm on RU-15

a) Corrective Action for Failure to Follow the Procedure:

A night order was issued to operations personnel to reiterate the importance of control room personnel communicating important plant information to plant personnel.

b) Corrective Action for Inadequate Response to Local Alarm:

A memorandum was issued to site personnel on May 10, 1993, by the Vice President, Nuclear Production, regarding the tape placed over the RU-15 alarm. The memorandum emphasized the importance of the RMS and the necessity for personnel to respond properly to alarm conditions.

When a "high" alarm is received on RU-15, the local alarm for RU-15 locks in. The investigation of this event revealed that neither the RMS Technician nor the operations personnel interviewed were aware of this fact. A revision was made to Procedure 74RM-9EF41 to identify those RMS monitors for which it is necessary to acknowledge the "high" alarms locally.

During the time the monitor was alarming locally, approximately 200 people passed by the monitor without taking corrective action. In order to facilitate the proper response to RMS alarms, instruction labels have been posted at RMS monitors which have audible alarms directing personnel to contact the Control Room or Chemistry if the monitor alarms. In addition, Site Access Training was revised to include additional information as to what is expected of plant personnel in response to alarms.

In the cover letter of NRC Inspection Report 93-29, the NRC requested that APS address whether any such incidents of this nature had previously occurred. An investigation into this request was performed through a review of the computerized database of recorded incidents and a review of NRC inspection reports back to 1988. In the Facility Tours Section of NRC Inspection Report 50-528/88-40, 50-529/88-39 and 50-530/88-38 there was a brief mention of an alarming RMS monitor which went unacknowledged for an unspecified period of time. No other incidents of this nature were identified from this search.

2) Response to March 14, 1993, alarm on RU-140

An evaluation of the RMS Technician's actions following the SGTR was conducted and it was determined the alarm response procedure does not provide adequate direction or flexibility for significant operational events of this nature.

3) Revision of RU-15 Setpoints on March 14, 1993

Appropriate disciplinary action was administered to the RMS Technician and supervisor responsible for the RU-15 setpoint change.

The RMS setpoint change process was reviewed during second quarter industry events training for RMS technicians.

Corrective Actions That Will Be Taken To Avoid Further Violations

The following actions will be taken to avoid further violations:

1) Response to May 4, 1993, alarm on RU-15

a) Corrective Action for Failure to Follow the Procedure:

A change to the RMS software will be evaluated by October 15, 1993, to determine if the system can be set up such that both the control room and the RMS Technician are required to acknowledge alarms.

This violation is being evaluated by the Training Department for inclusion in discipline-specific industry events training. This evaluation will be complete by October 30, 1993.

b) Corrective Action for Inadequate Response to Local Alarm:

The actions described above are adequate to avoid further violations.

2) Response to March 14, 1993, alarm on RU-140

Chemistry will provide additional guidance in Procedure 74RM-9EF41 by October 15, 1993, regarding response to significant operational events with respect to setting priorities for alarm response tasks, use of alarm response procedures, and performing tasks directed by the Emergency Operating Procedures.

3) Revision of RU-15 Setpoints on March 14, 1993

The actions described above are adequate to avoid further violations.

Date When Full Compliance Will Be Achieved

1) Response to May 4, 1993, alarm on RU-15

Full compliance was achieved at 1630 on May 4, 1993, when the local alarm for RU-15 was acknowledged by the RMS Technician.

2) Response to March 14, 1993, alarm on RU-140

Full compliance for failure to verify the database for RU-140 was achieved on March 29, 1993, when the database was verified as part of routine activities.

3) Revision of RU-15 Setpoints on March 14, 1993

Full compliance for the RU-15 setpoint change was achieved on March 24, 1993, when in accordance with Procedure 74RM-9EF42 the Unit Radiation Protection Manager approved the setpoint change, the setpoint change was documented in Appendix J of the procedure, and the bases for the setpoint change were documented in Appendix K.