



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
1600 E. LAMAR BLVD  
ARLINGTON TX 76011-4511

May 6, 2016

Mr. Randall K. Edington  
Executive Vice President, Nuclear/CNO  
Mail Station 7602  
Arizona Public Service Company  
P.O. Box 52034  
Phoenix, AZ 85072-2034

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 –  
NRC PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION  
REPORT 05000528/2016008, 05000529/2016008, AND 05000530/2016008

Dear Mr. Edington,

On March 24, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed a problem identification and resolution biennial inspection at your Palo Verde Nuclear Generating Station, Units 1, 2, and 3. The NRC inspection team discussed the results of this inspection with Ms. M. Lacal, Vice President, Nuclear Regulatory and Oversight, and other members of your staff. The inspection team documented the results of this inspection in the enclosed inspection report.

Based on the inspection sample, the inspection team determined that the Palo Verde Nuclear Generating Station's corrective action program and your staff's implementation of the corrective action program were adequate to support nuclear safety.

In reviewing your corrective action program, the team assessed how well your staff identified problems at a low threshold, your staff's implementation of the station's process for prioritizing and evaluating these problems, and the effectiveness of corrective actions taken by the station to resolve these problems. The team also evaluated other processes your staff used to identify issues for resolution. These included your use of audits and self-assessments to identify latent problems and your incorporation of lessons learned from industry operating experience into station programs, processes, and procedures. The team determined that your station's performance in each of these areas supported nuclear safety.

Finally, the team determined that your station's management maintains a safety-conscious work environment in which your employees are willing to raise nuclear safety concerns through at least one of the several means available.

The NRC inspection team documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements.

Further, the team documented a licensee-identified violation, which was determined to be of very low safety significance, in this report. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violations, or significance of these NCVs, 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, Region IV; 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.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV; and the NRC resident inspector at the Palo Verde Nuclear Generating Station.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management 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 Thomas R. Farnholtz for/**

Thomas R. Hipschman, Team Leader  
Inspection Program and Assessment Team  
Division of Reactor Safety

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

Enclosure:  
Inspection Report 05000528/2016008,  
05000529/2016008, and 05000530/2016008  
w/ Attachments:  
1. Supplemental Information  
2. Information Request

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Letter to Randall K. Edington from Thomas R. Hipschman, dated May 6, 2016

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 –  
NRC PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION  
REPORT 05000528/2016008, 05000529/2016008, AND 05000530/2016008

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Dockets: 05000528, 05000529, 05000530

License: NPF-41, NPF-51, NPF-74

Report: 05000528/2016008, 05000529/2016008, 05000530/2016008

Licensee: Arizona Public Service Company

Facility: Palo Verde Nuclear Generating Station

Location: 5801 South Wintersburg Road  
Tonopah, AZ 85354

Dates: March 8 through March 24, 2016

Team Lead: R. Azua, Senior Reactor Inspector

Inspectors: E. Ruesch, Senior Reactor Inspector  
D. You, Resident Inspector  
A. Nguyen, Senior Resident Inspector  
D. Holman, Senior Physical Security Inspector

Approved By: T. Hipschman, Team Lead  
Inspection Program and Assessment Team  
Division of Reactor Safety

Enclosure

## SUMMARY

IR 05000528/2016008, 0500529/2016008, 05000530/2016008; 03/08/2016 – 03/24/2016;  
Palo Verde Nuclear Generating Station; Problem Identification and Resolution (Biennial)

The inspection activities described in this report were performed between March 8 and March 24, 2016, by three inspectors from the NRC's Region IV offices, the senior resident inspector at Palisades Nuclear Generating Station, and the resident inspector at the Palo Verde Nuclear Generating Station. The report documents one finding of very low safety significance (Green). This finding involved a violation of NRC requirements. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects Within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

### Assessment of Problem Identification and Resolution

Based on its inspection sample, the team concluded that the licensee maintained a corrective action program in which individuals generally identified issues at an appropriately low threshold. Once entered into the corrective action program, the licensee generally evaluated and addressed these issues appropriately and timely, commensurate with their safety significance. The licensee's corrective actions were generally effective, addressing the causes and extents of condition of problems.

The licensee appropriately evaluated industry operating experience for relevance to the facility and entered applicable items in the corrective action program. The licensee incorporated industry and internal operating experience in its root cause and apparent cause evaluations. The licensee performed effective and self-critical nuclear oversight audits and self-assessments. The licensee maintained an effective process to ensure significant findings from these audits and self-assessments were addressed.

The licensee maintained a safety-conscious work environment in which personnel were willing to raise nuclear safety concerns without fear of retaliation.

### Cornerstone: Mitigating Systems

- Green. The team identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the licensee's failure to document conditions adverse to quality in the corrective action program. Previous similar failures to initiate condition reports led to, or contributed to, two significant conditions adverse to quality over the last 15 months.

The failure of the operations department to document identified conditions adverse to quality in condition reports, as required by Procedure 01DP-0AP12, "Condition Reporting Process," Revision 23, was a performance deficiency. This performance deficiency was more than minor, and therefore a finding, because if left uncorrected, it had the potential to lead to a more significant safety concern. Specifically, on two other occasions since January 2015,

failures by operations personnel to write condition reports for equipment-related problems resulted in or contributed to significant conditions adverse to quality. This performance deficiency demonstrated a continued gap within Palo Verde Nuclear Generation Station's operations department in understanding condition report initiation criteria. This performance deficiency is associated with the mitigating systems cornerstone. Using NRC Inspection Manual Chapter 0609, Appendix A, the team determined that this finding was of very low safety significance (Green) because it did not affect the operability or functionality of a mitigating structure, system, or component. This finding has a resolution cross-cutting aspect in the area of problem identification and resolution because the licensee failed to take effective corrective actions to address issues in a timely manner commensurate with their safety significance (P.3).

### **Licensee-Identified Violations**

A violation of very low safety significance, that was identified by the licensee, has been reviewed by the inspection team. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and associated corrective action tracking numbers are listed in Section 4OA7 of this report.

## REPORT DETAILS

### 4. OTHER ACTIVITIES (OA)

#### 4OA2 Problem Identification and Resolution (71152)

The team based the following conclusions on a sample of corrective action documents that were open during the assessment period, which ranged from March 29, 2014, to the end of the on-site portion of this inspection on March 24, 2016.

##### .1 **Assessment of the Corrective Action Program Effectiveness**

###### a. Inspection Scope

The team reviewed approximately 300 condition reports, action requests, and condition report disposition requests (CRDRs),<sup>1</sup> including associated root cause analyses and apparent cause evaluations, from approximately 32,000 that the licensee had initiated or closed between March 29, 2014, and March 24, 2016. The majority of these (approximately 27,000) were lower-level condition reports that did not require cause evaluations. The inspection sample focused on higher-significance condition reports for which the licensee evaluated and took actions to address the cause of the condition. In performing its review, the team evaluated whether the licensee had properly identified, characterized, and entered issues into the corrective action program, and whether the licensee had appropriately evaluated and resolved the issues in accordance with established programs, processes, and procedures. The team also reviewed these programs, processes, and procedures to determine if any issues existed that may impair their effectiveness.

The team reviewed a sample of performance metrics, system health reports, operability determinations, self-assessments, trending reports and metrics, and various other documents related to the licensee's corrective action program. The team evaluated the licensee's efforts in determining the scope of problems by reviewing selected logs, work orders, self-assessment results, audits, system health reports, action plans, and results from surveillance tests and preventive maintenance tasks. The team reviewed daily condition reports and attended the licensee's Screening Committee, Operability Determination Challenge Board, Condition Review Group, and Corrective Action Review Board meetings to assess the reporting threshold and prioritization efforts, and to observe the corrective action program's interfaces with the operability assessment and work control processes. The team's review included an evaluation of whether the licensee considered the full extent of cause and extent of condition for problems, as well

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<sup>1</sup> The Palo Verde Nuclear Generating Station (PVNGS), in 2015, began transitioning away from their multi-staged action request system. In this system, personnel documented all identified conditions in Palo Verde action requests (PVARs), which, following screening, could have resulted in CRDRs being generated. Following further evaluation, condition report action items (CRAIs) would have been generated to correct the identified conditions. The licensee transitioned to a condition reporting system referred to as the Corrective Action Program (CAP-1). This, like the previous program, is a single-point-of-entry program. In this system, personnel document all identified conditions in condition reports, which experience increased levels of screening in the prioritization, resolution, and performance monitoring process. Planned Corrective Actions (CAs) are tracked with the initiating condition reports.

as a review of how the licensee assessed generic implications and previous occurrences of issues. The team assessed the timeliness and effectiveness of corrective actions, completed or planned, and looked for additional examples of problems similar to those the licensee had previously addressed. The team conducted interviews with plant personnel to identify other processes that may exist where problems may be identified and addressed outside the corrective action program.

The team reviewed corrective action documents that addressed past NRC-identified violations to evaluate whether corrective actions addressed the issues described in the inspection reports. The team reviewed a sample of corrective actions closed to other corrective action documents to ensure that the ultimate corrective actions remained appropriate and timely. The team reviewed a sample of condition reports where the licensee had changed the significance level after initial classification to determine whether the level changes were in accordance with station procedure and that the conditions were appropriately addressed.

The team considered risk insights from both the NRC's and Palo Verde Nuclear Generating Station's risk models to focus the sample selection and plant tours on risk-significant systems and components. The team focused a portion of its sample on the direct current electrical system, which the team selected for a five-year in-depth review. The team conducted walk-downs of this system and other plant areas to assess whether licensee personnel identified problems at a low threshold and entered them into the corrective action program.

b. Assessments

1. Effectiveness of Problem Identification

During the 24-month inspection period, licensee staff generated approximately 32,000 condition reports. The team determined that most conditions that required generation of a condition report in accordance with Palo Verde Nuclear Generating Station Procedure 01DP-0AP12, "Condition Reporting Process," Revision 23, had been entered appropriately into the corrective action program. However, the team noted an example where the licensee had failed to properly document a condition in accordance with plant corrective action program procedures:

- On March 21, 2016, while touring the Unit 3 containment spray pump room, the team identified an apparent low oil level condition in the lower motor bearing sight glass. The team brought this to the attention of an auxiliary operator in the area, who logged the bearing oil level as unsatisfactory, discussed the deficiency with the shift manager, and initiated actions to refill the lower bearing oil reservoir. However, none of the personnel involved documented the unsatisfactory condition in a condition report. As a result, no on-shift licensed operators made a formal determination of operability. In subsequent discussions with operations personnel, the licensee informed the team that the shift manager had performed an evaluation of operability based on visual observation of the oil level in the sight glass; based on this observation, the shift manager made the determination that the pump was operable. However, since the licensee did not

generate a condition report, this evaluation was not documented. In addition, the team noted that on two other occasions during the inspection period, operation's personnel failure to initiate a condition report when required, contributed to significant conditions adverse to quality. This issue is further discussed in Section 4OA2.5 of this report.

Overall, the team concluded that the licensee generally maintained a low threshold for the formal identification of problems and entry into the corrective action program for evaluation. Licensee personnel initiated an average of 1100 condition reports per month during the inspection period. Most of the personnel interviewed by the team understood the requirements for condition report initiation; most expressed a willingness to enter newly identified issues into the corrective action program at a very low threshold.

## 2. Effectiveness of Prioritization and Evaluation of Issues

The sample of condition reports reviewed by the team focused primarily on issues screened by the licensee as having higher-level significance, including those that received cause evaluations, those classified as significant conditions adverse to quality, and those that required engineering evaluations. The team also reviewed a number of condition reports that included or should have included immediate operability determinations to assess the quality, timeliness, and prioritization of these determinations.

With the licensee's transition to CAP-1, a new process was added to the condition report database for flagging condition reports requiring operability or functionality assessments. In general, condition report initiators, their section leaders, the condition report screening committee, or the Operability Determination Challenge Board, will appropriately route equipment deficiencies that could potentially affect operability or functionality to the control room for assessment in a timely manner. However, the team did identify a few examples where immediate operability or functionality assessments did not occur in a timely manner as required by station Procedure 40DP-9OP26, "Operations Condition Reporting Process and Operability Determination/Functional Assessment."

- The team identified an example where the licensee wrote a condition report identifying NAMCO limit switches, located in the steam generator system, as not having the appropriate equipment reliability code in the equipment database. This code is an integral part of Palo Verde Nuclear Generating Station's preventive maintenance process. The failure to have the appropriate code was inconsistent with the Palo Verde Nuclear Generating Station's Updated Final Safety Analysis Report provision that requires adequately maintaining quality-related items in order for them to perform their design function. The team questioned the licensee as to why the condition report had not been routed to the control room for an immediate operability or functionality assessments, since it had the potential to affect installed plant equipment. The licensee generated a condition report for this issue and an immediate operability or functionality

assessments was completed for the limit switches. All affected components were determined to be operable.

- The team also reviewed root cause and apparent cause evaluations performed by the licensee to ensure the causes of equipment deficiencies and human performance events were evaluated, prioritized and corrected commensurate with their safety significance and in accordance with station procedures. The team identified one example where evaluation of the extent of condition of a root cause (Level 1 evaluation) conducted for an event during the fall 2015 Unit 2 refueling outage was not completed in sufficient detail to fully address the issue. Specifically, during a refueling outage, a fuel assembly contacted and bent the upper grid strap of another assembly while reloading the core. The extent of condition review was not thorough in assessing the degree to which the condition could have existed at the other units. The basis for determining that this issue had not occurred at the other units was that no noise had been heard, or overload alarm received on the refueling bridges, during these units' reloading operations. However, it was not apparent that refueling logs or videos, taken during core reload or fuel assembly inspections, had been reviewed to ensure that no abnormal operations with the fuel assemblies had transpired. This additional information would have provided more evidence that the extent of condition for grid strap damage to the fuel assembly event was limited to the issue evaluated in the root cause.

Overall, the team determined that the licensee's process for screening and prioritizing issues that had been entered into the corrective action program supported nuclear safety. The licensee's operability determinations were consistent, accurately documented, and completed in accordance with procedures.

### 3. Effectiveness of Corrective Actions

The team reviewed corrective actions taken for root and apparent cause evaluations and previously identified non-cited violations (NCVs) and findings. The purpose of this effort was to determine if the licensee had developed qualitative or quantitative measures of success for determining the effectiveness of the corrective actions to prevent recurrence. The team also evaluated whether the actions taken by the licensee were timely and complete. Some examples of licensee failure to ensure that adequate corrective actions were either appropriate, timely, or completely accomplished were identified:

- The team identified where an effectiveness review did not have specific or measurable criteria for determining if an action was adequate. While reviewing an apparent cause evaluation for an NRC-identified NCV, the team noted that the corrective action to resolve the violation was to revise a procedure for performance testing of the Diesel Generator HVAC system. The effectiveness review was to provide objective evidence that the procedure was revised. This effectiveness measure did not monitor the performance of the corrective action to verify its success in minimizing the possibility of occurrence as is required per the station procedure for resolving NRC violations.

- The team also identified examples where the licensee was not conducting effectiveness reviews for interim actions related to corrective actions to prevent recurrence as required by station Procedure 01DP-0AP12, "Condition Reporting Process." Two examples were found while reviewing root cause evaluations related to a fuel assembly upper grid strap being damaged during core reloading activities and a breaker ground clip misalignment causing an arc flash. Neither of these root cause reports contained effectiveness reviews for interim actions that were taken while the corrective actions to prevent recurrence were being implemented. Procedure 01DP-0AP12, Section J.2.3.2, states, in part, that when interim actions are taken pending completion of the corrective actions to prevent recurrence or the corrective actions to prevent recurrence requires an extended period of time to challenge, then interim monitoring actions shall be developed to determine effectiveness. Contrary to this procedural requirement, the two aforementioned evaluations did not assign interim monitoring actions to assess the effectiveness of interim corrective actions until the corrective actions to prevent recurrence could be completed. This is a minor performance deficiency because no other examples were found during the team's review of other root cause evaluations, so the issue was not classified as programmatic.
- An example of incomplete and untimely corrective actions was identified for an issue where valves were not being tested on an increased frequency, following maintenance, as required by the ASME code. The licensee performed an extent of condition on the original population of motor operated valves to determine if a programmatic issue existed. The issue was determined to effect many motor operated valves in the licensee's motor operated valves program; however, the initial extent of condition only missed a few valves. The licensee later identified these motor operated valves and added them to the increased testing frequency program as required. At the time of the inspection, many of the valves' testing frequencies had not been updated in the licensee's equipment database, which could have prevented them from being tested at the appropriate time. There were a few examples of motor operated valves where this did occur. This issue of not testing motor operated valves at the required frequency is documented as a licensee-identified violation in Section 4OA7 of this report.

Overall, the team concluded that the licensee generally identified effective corrective actions for the problems evaluated in the corrective action program. The licensee generally implemented these corrective actions in a timely manner, commensurate with their safety significance, and reviewed the effectiveness of the corrective actions appropriately.

## **.2 Assessment of the Use of Operating Experience**

### **a. Inspection Scope**

The team examined the licensee's program for reviewing industry operating experience, including reviewing the governing procedures. The team reviewed a sample of seven industry operating experience communications and the associated site evaluations to

assess whether the licensee had appropriately assessed the communications for relevance to the facility. The team also reviewed assigned actions to determine whether they were appropriate.

b. Assessment

Overall, the team determined that the licensee appropriately evaluated industry operating experience for its relevance to the facility. Operating experience information was incorporated into plant procedures and processes as appropriate.

The team further determined that the licensee appropriately evaluated industry operating experience when performing root cause analysis and apparent cause evaluations. The licensee appropriately incorporated both internal and external operating experience into lessons learned for training and pre-job briefs.

**.3 Assessment of Self-Assessments and Audits**

a. Inspection Scope

The team reviewed a sample of licensee self-assessments and audits to assess whether the licensee was regularly identifying performance trends and effectively addressing them. The team also reviewed audit reports to assess the effectiveness of assessments in specific areas. The specific self-assessment documents and audits reviewed are listed in Attachment 1.

b. Assessment

Overall, the team concluded that the licensee had an effective self-assessment and audit process. The team determined that self-assessments were self-critical and thorough enough to identify deficiencies.

**.4 Assessment of Safety-Conscious Work Environment**

a. Inspection Scope

The team interviewed 50 individuals in five focus groups. The purpose of these interviews was (1) to evaluate the willingness of licensee staff to raise nuclear safety issues, either by initiating a condition report or by another method, (2) to evaluate the perceived effectiveness of the corrective action program at resolving identified problems, and (3) to evaluate the licensee's safety-conscious work environment. The focus group participants included personnel from the Operations, work management, maintenance, maintenance projects, radiation protection, chemistry, fire protection, engineering (design, plant, fuels, and engineering support), and security (operations and programs) groups. At the team's request, the licensee's regulatory affairs staff selected the participants as randomly as possible from these work groups, based partially on availability. To supplement these focus group discussions, the team interviewed the employee concerns program manager and staff to assess their perceptions of the site employees' willingness to raise nuclear safety concerns. The team reviewed the

employee concerns program case log and select case files. The team also reviewed the results of third-party safety culture evaluations and the minutes from recent safety culture monitoring panel meetings.

b. Assessment

1. Willingness to Raise Nuclear Safety Issues

All individuals interviewed indicated that they would raise nuclear safety concerns. All felt that their management was generally receptive to nuclear safety concerns and was willing to address them promptly. All of the interviewees further stated that if they were not satisfied with the response from their immediate supervisor, they had the ability to escalate the concern to a higher organizational level. Most expressed positive experiences after raising issues to their supervisors, though some noted that higher management levels may not be as receptive. Most expressed positive experiences documenting most issues in condition reports.

A small number of interviewees indicated that there may be some hesitance among some contract staff to initiate condition reports or otherwise raise concerns. However, it appeared that in such cases these contractors would likely raise the concern to a peer in the Arizona Public Service Company organization who would write a condition report to ensure the issue was addressed.

The team noted that there continued to be indications of low-level issues in some workgroups in which individuals may be hesitant to raise concerns. These challenges, which were confirmed by safety culture assessments, appeared to be isolated to concerns that the individuals did not believe affected nuclear safety. The licensee appeared to have improved in this area since the previous problem identification and resolution inspection in 2014; ongoing corrective actions to address these areas appeared on track and adequate.

2. Employee Concerns Program

All interviewees were aware of the employee concerns program. Most explained that they had heard about the program through various means, such as training, newsletters, and - in the case of a few work groups - presentations or introductions by employee concerns program personnel at one or more of the work groups' periodic meetings. Approximately 90 percent of interviewees stated that they would use the employee concerns program if they felt it was necessary. However, several expressed concern with the location of the employee concerns program office. The team noted that the licensee had made progress in addressing the employee concerns program challenges described in the previous NRC Biennial Problem Identification and Resolution Inspection Report (ML14134A307).

3. Preventing or Mitigating Perceptions of Retaliation

When asked if there have been any instances where individuals experienced retaliation or other negative reaction for raising issues, all individuals interviewed

stated that they had neither experienced nor heard of an instance of retaliation, harassment, intimidation, or discrimination at the site in recent years. The team noted that station management appeared to be successfully implementing the organization's processes to mitigate any such issues.

## **.5 Findings**

### **a. Operations Department Failure to Document Conditions Adverse to Quality in Condition Reports**

Introduction. The team identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the licensee's failure to document conditions adverse to quality in the corrective action program. Previous similar failures to initiate condition reports had led to or contributed to two significant conditions adverse to quality over the last 15 months.

Description. On March 21, 2016, while touring the Unit 3 containment spray pump room, the team identified an apparent low oil level condition in the lower motor bearing sight glass. The team brought this to the attention of an auxiliary operator in the area, who logged the bearing oil level as unsatisfactory, discussed the deficiency with the shift manager, and initiated actions to refill the low bearing oil reservoir. However, none of the personnel involved documented the unsatisfactory condition in a condition report. As a result, no on-shift licensed operators made a formal determination of operability. In subsequent discussions with operations personnel, the team was told that the shift manager had performed an evaluation of operability based on visual observation of the oil level in the sight glass and, based on this observation, the shift manager made the determination that the pump was operable. However, because no condition report had been generated, this evaluation was not documented.

The team noted that over the previous 15 months, there had been at least two consequential examples where operations personnel failed to initiate condition reports at a low threshold. Both of these instances, identified by the licensee during root cause evaluations, resulted in or contributed to significant conditions adverse to quality that may have been prevented or mitigated by timely condition report generation:

- On January 24, 2015, the licensee identified that a plant computer alarm point for steam generator differential pressure had been in alarm for 13 days in the Unit 2 control room, resulting in a violation of technical specifications. During the root cause evaluation for this event, documented in Significant Condition Report Disposition Request CRDR<sup>2</sup> 4618033, the licensee identified that operators did not treat plant computer alarms the same as alarms from the plant annunciator system. As a result, no action requests had been generated when the alarm initially came in on January 11, 2015, to prompt evaluation and action by the station.

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<sup>2</sup> A Significant CRDR under PVNGSs previous corrective action program structure documented a significant condition adverse to quality and required a root cause evaluation. This is the equivalent of a Level 1 condition report requiring a Level 1 cause evaluation under the current CAP-1 system.

- On May 27, 2015, during an oil change on Unit 3 high pressure safety injection pump A, the licensee identified Babbitt material in the oil. The subsequent repair activities resulted in the licensee exceeding the technical specification allowed outage time for the pump. During the root cause evaluation for this event, documented in Significant Condition Report Disposition Request CRDR 4661343, the licensee identified that on April 20, 2015, after completion of work on the pump during refueling outage U3R18, an area operator had noted that the bearing oil appeared “gray and milky.” The operator communicated this observation to the control room, but no Palo Verde action request was generated to document the condition.

The team noted that the licensee’s failure to initiate a condition report for the March 21, 2016, low containment spray pump motor bearing oil indicated that corrective actions for these prior two failures to document conditions adverse to quality had not been fully effective.

The licensee initiated Condition Report 16-04598 to document this failure to initiate a condition report for a condition with the potential to impact the operability of safety-related equipment, which is contrary to the requirements of Step 4.2.4 of 01DP-0AP12, “Condition Reporting Process,” Revision 23.

Analysis. The failure of the operations department to document identified conditions adverse to quality in condition reports as required by Procedure 01DP-0AP12 was a performance deficiency. This performance deficiency was more than minor, and therefore a finding, because if left uncorrected, it had the potential to lead to a more significant safety concern. Specifically, on two other occasions since January 2015, failures by operations personnel to write condition reports for equipment-related problems resulted in or contributed to significant conditions adverse to quality. This performance deficiency demonstrated a continued gap within Palo Verde Nuclear Generating Station’s operations department in understanding condition report initiation criteria. This performance deficiency is associated with the mitigating systems cornerstone. Using NRC Inspection Manual Chapter 0609 Appendix A, the team determined that this finding was of very low safety significance (Green) because it did not affect the operability or functionality of a mitigating structure, system, or component. This finding has a resolution cross-cutting aspect in the area of problem identification and resolution because the licensee failed to take effective corrective actions to address issues in a timely manner commensurate with their safety significance (P.3).

Enforcement. Title 10 of the *Code of Federal Regulations*, Part 50, Appendix B, Criterion XVI, requires in part that measures be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to this requirement, on three occasions between January 2015 and March 2016, measures established by the licensee failed to ensure that conditions adverse to quality were promptly identified and corrected. Specifically, Procedure 01DP-0AP12, “Condition Reporting Process,” Revision 23, and other measures established by the licensee failed to ensure that the licensee initiated condition reports following the identification by operations personnel of degraded or nonconforming conditions associated with safety-related equipment. On two of these occasions, the failure to document and correct these conditions resulted in

significant conditions adverse to quality. Because the associated finding was of very low safety significance and the performance deficiency was entered into the licensee's corrective action program as Condition Report 16-04598, this violation is being treated as a non-cited violation in accordance with Section 2.3.2.a of the NRC Enforcement Policy: NCV 2016008-01, "Failure of Operations Personnel to Document Conditions Adverse to Quality in a Condition Report."

#### **4OA6 Meetings, Including Exit**

##### Exit Meeting Summary

On April 24, the team presented the inspection results to Ms. M. Lacal, Vice President, Nuclear Regulatory and Oversight, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the team had been returned or destroyed.

#### **4OA7 Licensee-Identified Violations**

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements that meets the criteria of the NRC Enforcement Policy for being dispositioned as a non-cited violation:

- Title of 10 CFR 50.55a(f)(4), requires, in part, that pumps and valves classified as ASME Code Class 1, 2, or 3 must meet the inservice test requirements set forth in the ASME Operation and Maintenance (OM) Code and addenda to the extent practical within the limitations of design, geometry, and materials of construction of the components. The inservice testing program is incorporated into the Palo Verde Nuclear Generation Station licensing basis under Technical Specification 5.5.8 and governed by the procedures controlled under that specification. ASME OM Code Case OMN-1 was adopted by Palo Verde Nuclear Generating Station per Valve Relief Request number 1, and approved by the NRC as an alternative for performing Code-required valve and pump testing for the second and third 10-year testing intervals (January 1998-2018). ASME OMN-1, Section 3.3.1(b) requires that, "if insufficient data exist to determine the inservice test frequency...then [motor operated valve] MOV inservice testing shall be conducted every two refueling cycles or three years until sufficient data exist to determine a more appropriate test frequency." Palo Verde Nuclear Generating Station Procedure 73DP-9ZZ12, "Motor Operated Valve Program," Section 4.5.4.5, and Appendix H, define when sufficient test data exists to justify increasing test frequencies beyond 3 years. This criteria includes completing at least two complete diagnostic testing cycles constituting a baseline pre-service test and two subsequent as-found tests. These testing requirements are invoked after complete replacement of the valve, installation of a new valve, or major maintenance, which could substantially change the valve/actuator performance. Contrary to the requirements listed above, the licensee failed to perform Code-required testing for a total of 17 valves between 2008 and 2016. The licensee identified an issue in May 2015 with the testing frequency of five valves after a modification installed new motor operated valves in the charging system. An extent of condition was performed and 11 additional valves were identified as being non-compliant. An engineering evaluation was performed to assess and manage the risk of not completing the required ASME testing per Technical Specification Surveillance

Requirement 3.0.3. A prompt operability determination was also performed to provide reasonable assurance of operability until the valves could be tested again. In January 2016, an additional valve was identified as being non-compliant and a separate operability evaluation was completed to provide reasonable assurance that the valve would still perform its function. There are currently seven valves that are still in non-compliance with the Code-required testing frequency; all other valves have been tested satisfactorily and are now in compliance. Those still requiring testing are scheduled during their respective next available system windows.

This violation is of very low safety significance (Green) because the non-conforming valves were determined to have reasonable assurance of operability. The licensee entered the condition into its corrective action program and initiated corrective actions to restore compliance under Condition Report 15-02470.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

G. Andrews, Director, Nuclear Regulatory Affairs  
B. Berles, Director, Engineering  
G. Cameron, Section Leader, Nuclear Regulatory Affairs and Compliance  
M. Cosenza, Department Leader, Security Programs  
M. Darlington, Section Leader, Security Operations  
R. Davis, Director, Nuclear Security and Emergency Preparedness  
S. Dornseif, Consultant, Regulatory Affairs / Compliance  
J. Glass, Department Leader, Maintenance Performance Improvement  
C. Kharri, General Plant Manager, Site Operations  
M. Lacal, Vice President, Nuclear Regulatory and Oversight  
K. Martinez, Department Leader, Security Operations  
M. McGhee, Department Leader, Nuclear Regulatory Affairs  
L. McKinney, Section Leader, Security Training  
M. McLaughlin, General Plant Manager, Site Support  
C. Moeller, Director, Technical Support  
H. Ridenhour, Director, Maintenance  
T. Romy, Manager, Operations Support  
C. Schingeck, Manager, Unit Operations  
D. Wheeler, Director, Performance Improvement

#### **NRC Personnel**

C. Peabody, Senior Resident Inspector

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### **Opened and Closed**

05000528; 529; 530/2016008-01	NCV	Operations Department Failure to Document Conditions Adverse to Quality in Condition Reports (Section 4.5)
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## LIST OF DOCUMENTS REVIEWED

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision Date</u>
01DP-0AP01	Procedure Process	52
01DP-0AP12	Condition Reporting Process	23
01DP-0IS13	Palo Verde Nuclear Generating Station Electrical Safe Work Practices	12
01DP-0QF01	Communications Standards	0
01DP-9ZZ01	Systematic Troubleshooting	10
16DP-0EP22	Emergency Plan Maintenance	11
20DP-0SK34	PVNGS Safety/Security Interface	6
20DP-0TR01	Security Personnel Training	27
30DP-0AP01	Maintenance Work Order Writers Guide	53
30DP-9MC01	Staging and Control of Maintenance Materials	24
30DP-9MP18	Work-At-Risk Process	1
30DP-9MP19	Electrical Enclosure Inspections	2
40DP-9OP15	Operator Challenges and Discrepancy Tracking	28
40DP-9OP26	Operations Condition Reporting Process and Operability Determination/Functional Assessment	42
40DP-9OP02	Conduct of Shift Operations	68
40DP-9OPA3	Area Operator Logs, Modes 1-4	77
40DP-9OP35	Operations Interface	18
40OP-9SG01	Main Steam	74
40DP-9WP01	Operations Processing Of Work Orders	32
40DP-9ZZ17	Control of Doors, Hatches and Floor Plugs	59
40OP-9ZZ23	Outage GOP	72
40AL-9RK4A	Panel B04B Alarm Responses	45
40AL-9RK2B	Panel B02B Alarm Responses	58
90DP-0IP13	Apparent Cause CRDR Evaluation	14
90DP-0IP14	Adverse CRDR Evaluation	14
93DP-0LC07-01	50.59 and 72.48 Administrative Guideline	2

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u> <u>Date</u>
93DP-0LC08	Regulatory Commitment Tracking	4
EP-0801	Hot Emergency Action Levels – Modes 1, 2, 3, 4	G
EP-0802	Cold Emergency Action Levels – Modes 5, 6, and Defueled	G
EP-0903	Accident Assessment	3
EP-0901	Classification	9
32MT-9ZZ52	Battery Charger Preventative Maintenance	31
32ST-9PK02	92-Day Surveillance Test of Station Batteries	36
32ST-9PK04	Surveillance of Class 1E Station Batteries Modified Performance Test Discharge	43
33TI-9HD01	Diesel Generator Building HVAC (HD) System Performance Testing	6
33TI-9HS02	Spray Pound Pump House HVAC (HS) System Performance Testing	5
72DP-9NF01	Control of SNM Configuration, Inventory, and Reporting	49
72IC-9RX03	Core Loading	46
73DP-9ZZ12	Motor Operated Valve Program	11
73DP-9ZZ26	Motor Operated Valve (MOV) Testing with Quiklook	3
73ST-9SI10	HPSI Pumps Miniflow – Inservice Test	50
73ST-9XI07	GA, GR, and RD Valves – Quarterly – Inservice Test	21
75RP-9OP02	Control of High Radiation Areas, Locked High Radiation Areas, and Very High Radiation Areas	27
78OP-9FX01	Refueling Machine Operations	51
78OP-9FX02	Fuel Transfer Machine	23
78OP-9FX03	Spent Fuel Transfer Machine	61
78TI-9RX01	Spent Fuel Inspection	13

Other  
Documents

CBT ESD13	Respiratory Protection for MSF	
EWR 4527645	DCID should be 1H01A	July 17, 2014

Other  
Documents

INPO 14-004	Conduct of Performance Improvement	0
Lesson Plan 15-02-09	ADVANTAGE 1000	February 3, 2015
Lesson Plan 15-02-10	MSA ADVANTAGE 1000	February 3, 2015
Lesson Plan 15-03-03	Qualification Cycle Training	April 29, 2015
Security Briefing 10-118-14	Response to RWT Alarms (both hatches)	October 24, 2014
Security Briefing 04-066-15	New (MSA Advantage 1000)	April 16, 2015
13-MC-HS-0008	Spray Pond Ventilation and Equipment Adequacy Calculation	5
13-MC-HD-0053	Diesel Generator Ventilation and Equipment Adequacy Calculation	6
03/02/01-EC- NA-0421	Arc Flash Hazard Calculations	0
TMod 4172119	Removal of Damaged Fuel Assembly P2Y107 in Unit 2	0
NA-02-C20- 2014-028	Unit 2 Cycle 20 Full Core Load Map	1-3
NMO01-09-071	Refueling Machine Operations Job Qualification Card	January 29, 2016
LSRO1C136801	Licensed Operator Continuing Training for Refueling Machine	February 16, 2016
03-EC-PK-0207	DC Battery Sizing and Minimum Voltage	
15-01894-001	Weaknesses in Supply Chain Organizational Effectiveness Apparent Cause Evaluation Report	1
13-03522-004	Procurement Cycle Integrated Self-Assessment	
	Unit 1 Fire Watch Tour	March 2, 2016
	Station Quality Issue Report Trends	January 2016
	Active Night Orders	March 9, 2016
	Active Standing Orders	March 9, 2016
	Operator Work Arounds	March 9, 2016

Other  
Documents

Open Operator Burdens	March 9, 2016
Control Room Discrepancies	March 9, 2016
Operations Challenges List	March 9, 2016
U3 Operator Logs: "CS Pp A Lower Motor Bearing Oil Level"	January 1, 2015 – March 22, 2016
Lube History: 3MSIAP03**MOTORX (U3 Containment Spray Motor Lower Bearing)	April 17, 2006 – March 23, 2016
2015 Nuclear Safety Cultural Assessment Results: Presentation to PVNGS Leaders	February 1, 2016
Soldiers Manual of Common Tasks, Warrior Skill Level 1	June 2009

PVNGS Corrective Action Documents

Condition Reports

13-00349	15-00144	15-05309	15-10567	16-03673
13-00477	15-00272	15-06253	15-11815	16-03684
13-00871	15-00299	15-07412	15-12108	16-03764
13-01889	15-00481	15-07489	15-12163	16-03843
14-00465	15-01058	15-08098	15-12620	16-03903
14-00873	15-01094	15-08188	16-00577	16-04112
14-01009	15-01181	15-08644	16-00740	16-04116
14-01342	15-01392	15-08646	16-00970	16-04130
14-01855	15-01677	15-08649	16-00988	16-04148
14-02061 R1	15-01894	15-08654	16-01108	16-04182
14-02061 R2	15-02333	15-08686	16-01398	16-04187
14-02138	15-02470	15-09110	16-01687	16-04343
14-02825	15-03150	15-09346	16-01846	16-04397
14-02837	15-03293	15-09487	16-03246	16-04442
14-03073	15-03300	15-10132	16-03580	16-04444
14-03143	15-03522	15-10200	16-03609	16-04445
14-03680	15-04664	15-10221	16-03614	16-04573
15-00138	15-04869	15-10450	16-03665	16-05092

Palo Verde Action Request (PVARs)/Condition Report Disposition Request (CRDR)  
/Condition Report Action Item (CRAI)

3164238	4449182	4527328	4562705	4588476	4617612
3311997	4453414	4527440	4566124	4588478	4618033
3438871	4453892	4528785	4567670	4588479	4619509
3837487	4454087	4529365	4568025	4588497	4619982
4026664	4457468	4529767	4568296	4590488 R1	4621624
4119669	4457868	4529826	4568732	4590488 R2	4623192
4122342	4457869	4530302	4568873	4590805	4623848
4122347	4468762	4531543	4571114	4590831	4623851
4124083	4468764	4531547	4572026	4593834	4624594
4124085	4474316	4532528	4574897	4594328	4627097
4136211	4482363	4532766	4578192	4594327	4627105
4143049	4492112	4532847	4578249	4598472	4631250
4171019	4496901	4538648	4581830	4599306	4633058
4213439	4498615	4540330	4584405	4599339	4635204
4251106	4500070	4540981	4584406	4599461	4641273
4251108	4500358	4541478	4584407	4599697	4642051
4260261	4500910	4543394	4584411	4599838	4652737
4277208	4501289	4544100	4584415	4599863	4652933
4297364	4501298	4544248	4584417	4600019	4653152
4361325	4510127	4546462	4585542	4600115	4661343
4363316	4512584	4546857	4585634	4602818	4662556
4365101	4514246	4549424	4587182	4603367	4664861
4380424	4514415	4550539	4587527	4603751	4667909
4410254	4516448	4550748	4587619	4608795	4684575
4433931	4522524	4551290	4587895	4610810	4742330
4439816	4522602	4555362	4587904	4612439	4756606
4440196	4523322	4558664	4588008	4614384	
4448264	4524927	4559074	4588055	4614881	

Work Orders

3166642	4189925	4392114	4600360	4628079	4697058
3270069	4213453	4457807	4600368	4628081	4697473
3439320	4245865	4472869	4600546	4628082	4707807
3771531	4259524	4502106	4603018	4636357	4710998

Work Orders

3854467	4307428	4516448	4603019	4640342	4711429
3907227	4344667	4530068	4603020	4640344	4712085
3987805	4377519	4579298	4605963	4640345	4737167
4043413	4392112	4593847	4614874	4663662	
4172119	4392113	4599828	4617613	4694917	

**Information Request**  
**Biennial Problem Identification and Resolution Inspection**  
**Palo Verde Nuclear Generating Station**  
**January 14, 2016**

**Inspection Report:** 50-528, -529, and -530/2016008

**On-site Inspection Dates:** March 7-11 and 21-25, 2016

This inspection will cover the period from March 30, 2014, through March 25, 2016. All requested information is limited to this period or to the date of this request unless otherwise specified. To the extent possible, the requested information should be provided electronically in word-searchable Adobe PDF (preferred) or Microsoft Office format. Any sensitive information should be provided in hard copy during the team's first week on site; do not provide any sensitive or proprietary information electronically.

Lists of documents ("summary lists") should be provided in Microsoft Excel or a similar sortable format. Please be prepared to provide any significant updates to this information during the team's first week of on-site inspection. As used in this request, "corrective action documents" refers to condition reports, notifications, action requests, cause evaluations, and/or other similar documents, as applicable to Palo Verde Nuclear Generating Station.

Please provide the following information no later than February 22, 2016:

i. Document Lists

Note: For these summary lists, please include the document/reference number, the document title, initiation date, current status, and long-text description of the issue.

- a. Summary list of all corrective action documents related to significant conditions adverse to quality that were opened, closed, or evaluated during the period
- b. Summary list of all corrective action documents related to conditions adverse to quality that were opened or closed during the period
- c. Summary lists of all corrective action documents that were upgraded or downgraded in priority/significance during the period (these may be limited to those downgraded from, or upgraded to, apparent-cause level or higher)
- d. Summary list of all corrective action documents initiated during the period that "roll up" multiple similar or related issues, or that identify a trend
- e. Summary lists of operator workarounds, operator burdens, temporary modifications, and control room deficiencies (1) currently open and (2) that were evaluated and/or closed during the period
- f. Summary list of safety system deficiencies that required prompt operability determinations (or other engineering evaluations) to provide reasonable assurance of operability
- g. Summary list of plant safety issues raised or addressed by the employee concerns program (or equivalent) (sensitive information should be made available during the team's first week on site—do not provide electronically)
- h. Summary list of all apparent cause evaluations completed during the period

2. Full Documents with Attachments

- a. Root cause evaluations completed during the period; include a list of any planned or in progress
- b. Quality Assurance audits performed during the period
- c. Audits/surveillances performed during the period on the corrective action program, of individual corrective actions, or of cause evaluations
- d. Functional area self-assessments and non-NRC third-party assessments (e.g., peer assessments performed as part of routine or focused station self- and independent assessment activities; do not include INPO assessments) that were performed or completed during the period; include a list of those that are currently in progress
- e. Any assessments of the safety-conscious work environment at Palo Verde Nuclear Generating Station
- f. Corrective action documents generated during the period associated with the following:
  - i. NRC findings and/or violations issued to Palo Verde Nuclear Generating Station
  - ii. Licensee event reports issued by Palo Verde Nuclear Generating Station
- g. Corrective action documents generated for the following, if they were determined to be applicable to Palo Verde Nuclear Generating Station (for those that were evaluated but determined not to be applicable, provide a summary list):
  - i. NRC Information Notices, Bulletins, and Generic Letters issued or evaluated during the period
  - ii. Part 21 reports issued or evaluated during the period
  - iii. Vendor safety information letters (or equivalent) issued or evaluated during the period
  - iv. Other external events and/or operating experience evaluated for applicability during the period
- h. Corrective action documents generated for the following:
  - i. Emergency planning drills and tabletop exercises performed during the period
  - ii. Maintenance preventable functional failures which occurred or were evaluated during the period

- iii. Adverse trends in equipment, processes, procedures, or programs that were evaluated during the period
- iv. Action items generated or addressed by offsite review committees during the period

3. Logs and Reports

- a. Corrective action performance trending/tracking information generated during the period and broken down by functional organization (if this information is fully included in item 3.c, it need not be provided separately)
- b. Corrective action effectiveness review reports generated during the period
- c. Current system health reports, Management Review Meeting package, or similar information; provide past reports as necessary to include ≥12 months of metric/trending data
- d. Radiation protection event logs during the period
- e. Security event logs and security incidents during the period (sensitive information should be made available during the team's first week on site—do not provide electronically)
- f. Employee Concern Program (or equivalent) logs (sensitive information should be made available during the team's first week on site—do not provide electronically)
- g. List of training deficiencies, requests for training improvements, and simulator deficiencies for the period

Note: For items 3.d–3.g, if there is no log or report maintained separate from the corrective action program, please provide a summary list of corrective action program items for the category described.

4. Procedures

Note: For these procedures, please include all revisions that were in effect at any time during the period.

- a. Corrective action program procedures, to include initiation and evaluation procedures, operability determination procedures, apparent and root cause evaluation/determination procedures, and any other procedures that implement the corrective action program at Palo Verde Nuclear Generating Station
- b. Quality assurance program procedures (specific audit procedures are not necessary)
- c. Employee concerns program (or equivalent) procedures
- d. Procedures which implement/maintain a safety-conscious work environment

5. Other
  - a. List of risk-significant components and systems, ranked by risk worth
  - b. Organization charts for plant staff and long-term/permanent contractors
  - c. Electronic copies of the UFSAR (or equivalent), technical specifications, and technical specification bases, if available
  - d. Table showing the number of corrective action documents (or equivalent) initiated during each month of the inspection period, by screened significance
  - e. For each day the team is on site,
    - i. Planned work/maintenance schedule for the station
    - ii. Schedule of management or corrective action review meetings (e.g. operations focus meetings, condition report screening meetings, corrective action review boards, MRMs, challenge meetings for cause evaluations, etc.)
    - iii. Agendas for these meetings

Note: The items listed in 5.d may be provided on a weekly or daily basis after the team arrives on site.

All requested documents should be provided electronically where possible. Regardless of whether they are uploaded to an internet-based file library (e.g., Certrec's IMS), please provide copies on CD or DVD. One copy of the CD or DVD should be provided to the resident inspector at Palo Verde Nuclear Generating Station; three additional copies should be provided to the team lead, to arrive no later than February 22, 2016:

John Reynoso  
U.S. NRC Resident Inspector Office  
Diablo Canyon N.P.S., Bldg. 104, Room 5/538  
7 1/2 miles NW of Avila Beach  
Avila Beach, CA 93424

#### **PAPERWORK REDUCTION ACT STATEMENT**

This request does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011.