



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

April 25, 2016

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 – NRC INTEGRATED
INSPECTION REPORT 05000528/2016001, 05000529/2016001, AND
05000530/2016001**

Dear Mr. Edington:

On March 31, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Palo Verde Nuclear Generating Station Units 1, 2, and 3. On April 6, 2016, the NRC inspectors discussed the results of this inspection with R. Bement, M. Lecal, and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. Two of these findings involved violations of NRC requirements.

Further, inspectors 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 non-cited violation (NCV) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violations or significance of the 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 e Palo Verde Nuclear Generating Station.

If you disagree with the 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 e 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

R. Edington

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Sincerely,

/RA/

Jeffrey E. Josey, Acting Chief
Project Branch D
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000528/2016001,
05000529/2016001, 05000530/2016001
w/ Attachment: Supplemental Information

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R. Edington

- 2 -

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Letter to R. Edington from J. Josey dated April 25, 2016

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION – NRC INTEGRATED
INSPECTION REPORT 05000528/2016001, 05000529/2016001, AND
05000530/2016001

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000528, 05000529, 05000530

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

Report: 05000528/2016001, 05000529/2016001, 05000530/2016001

Licensee: Arizona Public Service Company

Facility: Palo Verde Nuclear Generating Station

Location: 5801 South Wintersburg Road
Tonopah, AZ 85354

Dates: January 1 through March 31, 2016

Inspectors: C. Peabody, Senior Resident Inspector
D. Reinert, PhD, Resident Inspector
D. You, Resident Inspector
L. Carson II, Senior Health Physicist
N. Greene, PhD, Health Physicist

Approved By: Jeffrey E. Josey
Acting Chief, Project Branch D
Division of Reactor Projects

SUMMARY

IR 05000528, 529, 530/2016001; 01/01/20106 – 03/31/2016; PALO VERDE NUCLEAR GENERATING STATION; Occupational Dose Assessment and Follow-up of Events and Notices of Enforcement Discretion.

The inspection activities described in this report were performed between January 1 and March 31, 2016, by the resident inspectors at Palo Verde Nuclear Generating Station and inspectors from the NRC's Region IV office and other NRC offices. Two findings of very low safety significance (Green) are documented in this report. Two of these findings involve violations 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."

Cornerstone: Mitigating Systems

- Green. The inspectors documented a self-revealing non-cited violation of Technical Specification 3.7.2 Condition A for exceeding the allowed outage time of seven days. Specifically Unit 3's MSIV-181 actuator B was found to be inoperable from May 1, 2015 until August 15, 2015 when a design change installed a new swivel type fitting on an air-line without taking into account vibrational forces, as required by the station's procedure. This eventually resulted in the fatigue failure of the fitting, depressurizing the actuator B to less than 5000 psig. The licensee entered this condition in their corrective action program and performed a Level 2 cause evaluation under Condition Report 15-02686.

The inspectors concluded that the failure to take into account excessive vibrational stresses as required by procedure 81DP-0EE10, "Design Change Process" Step J.2.9.1, when implementing the design change was a performance deficiency. The performance deficiency was more than minor because it affected the equipment performance attribute of the Mitigating Cornerstone to ensure the availability, reliability, and the capability of systems that respond to initiating events to prevent undesirable consequences. Specifically the failure to account for the vibrational stresses resulted in the fatigue failure of the air-line fitting which depressurized one of two hydraulic accumulators thereby reducing the reliability of the system to initiate a fast closure of MSIV-181 upon receipt of a Main Steam Isolation Signal. The inspectors performed the initial significance determination using NRC Inspection Manual 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," Issue Date: 06/19/12. The finding screened as Green since the MSIV remained capable of performing its safety function with the alternate accumulator. The finding has a cross-cutting aspect in the area of human performance associated with the "avoid complacency" component. Specifically the licensee assumed there were no factors affecting the mechanical design requirements beyond the performance requirements. As a result the licensee failed to perform a thorough review of the mechanical conditions (such as vibrations) the air-line was subjected. [H.12]

Cornerstone: Occupational Radiation Safety

- Green. A self-revealing non-cited violation of 10 CFR 20.1701 was identified for the licensee's failure to implement adequate processes or engineering controls to control the concentration of radioactive material in air and prevent internal dose to workers. Specifically, on April 14, 2015, the licensee implemented inadequate engineering and radiological controls to remove a pre-filter and Y-connector from a high efficiency particulate air (HEPA) ventilation unit resulting in an airborne radioactivity condition and two intakes. The licensee was alerted to this issue when two radiation protection technicians alarmed PM12 portal monitors upon their exit from the radiologically controlled area. The licensee took immediate corrective actions and instructed these technicians to report to dosimetry for whole body counting and evaluation. The licensee entered this issue into their corrective action program as Condition Report (CR) CR 16-01093.

The failure to implement adequate engineering and radiological controls during HEPA unit maintenance in accordance with procedures and the radiological exposure permit requirements was a performance deficiency. The performance deficiency was more than minor because it was associated with the Occupational Radiation Safety attribute of Program and Process and adversely affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. This was evident by two workers receiving unplanned intakes. Using IMC 0609, Appendix C, Occupational Radiation Safety Significance Determination Process, issue date 8/19/2008, the finding was determined to be of very low safety significance (Green) because it did not involve: (1) as low as reasonably achievable (ALARA) planning and controls, (2) an overexposure, (3) a substantial potential for an overexposure, or (4) an impaired ability to assess dose. The inspectors concluded that the finding has a "Conservative Bias" cross-cutting aspect in the Human Performance area because the licensee failed to use decision-making practices that emphasized prudent choices over those that are simply allowable when they changed out the HEPA pre-filter and Y-connector components [H.14]. (Section 2RS4)

Licensee-Identified Violations

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

PLANT STATUS

Units 1, 2, and 3 operated at effective full power for the duration of the inspection period.

REPORT DETAILS

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed partial system walk-downs of the following risk-significant systems:

- January 5, 2016, Unit 3 4160V vital electrical bus A
- March 2, 2016, Unit 1 diesel generator B
- March 15, 2016, Unit 1 and Unit 3 diesel generators fuel oil head vent tanks
- March 24, 2016, Unit 2 diesel generator A fuel oil storage and transfer system

The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the systems. They visually verified that critical portions of the systems were correctly aligned for the existing plant configuration.

These activities constituted four partial system walk-down samples as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On March 29, 2016, the inspectors performed a complete system walk-down inspection of the Unit 2 essential chilled water system. The inspectors reviewed the licensee's procedures and system design information to determine the correct essential chilled water system lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, open condition reports, temporary modifications, and other open items tracked by the licensee's operations and engineering departments. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

This activity constituted one complete system walk-down sample, as defined in Inspection Procedure 71111.04

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Inspection

a. Inspection Scope

The inspectors evaluated the licensee's fire protection program for operational status and material condition. The inspectors focused their inspection on five plant areas important to safety:

- January 11, 2016, Unit 2 control room area, fire zone 17
- February 1, 2016, Unit 3 train A vital switchgear room, fire zone 5A
- February 16, 2016, Unit 2 diesel generator B, fire zones 21B and 22B
- February 18, 2016, Unit 3 diesel generator B, fire zone 21B
- February 18, 2016, Unit 1 diesel generator A, fire zone 21A

For each area, the inspectors evaluated the fire plan against defined hazards and defense-in-depth features in the licensee's fire protection program. The inspectors evaluated control of transient combustibles and ignition sources, fire detection and suppression systems, manual firefighting equipment and capability, passive fire protection features, and compensatory measures for degraded conditions.

These activities constituted five quarterly inspection samples, as defined in Inspection Procedure 71111.05

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

On February 4, 2016, the inspectors completed an inspection of the station's ability to mitigate flooding due to internal causes. After reviewing the licensee's flooding analysis, the inspectors chose one plant area containing risk-significant structures, systems, and components that were susceptible to flooding:

- Unit 2 essential pipe chase tunnel

The inspectors reviewed plant design features and licensee procedures for coping with internal flooding. The inspectors walked down the selected areas to inspect the design features, including the material condition of seals, drains, and flood barriers. The

inspectors evaluated whether operator actions credited for flood mitigation could be successfully accomplished.

This activity constitutes completion of one flood protection measure as defined in Inspection Procedure 71111.06

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)

.1 Review of Licensed Operator Requalification

a. Inspection Scope

On January 27, 2016, the inspectors observed an evaluated simulator scenario performed by an operating crew. The inspectors assessed the performance of the operators and the evaluators' critique of their performance.

This activity constitutes completion of one quarterly licensed operator requalification program sample, as defined in Inspection Procedure 71111.11

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

On January 19, 2016, the inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, Unit 3 was in a period of heightened activity due to conducting a 24-hour diesel generator B run followed by a load rejection test and a hot start test.

In addition, the inspectors assessed the operators' adherence to plant procedures, including Conduct of Shift Operations procedure and other operations department policies.

This activity constitutes completion of one quarterly licensed operator performance sample, as defined in Inspection Procedure 71111.11

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed two instances of degraded performance or condition of safety-related structures, systems, and components (SSCs):

- February 25, 2016, Unit 2 charging pump A, repetitive failures due to improper finger plate installation
- March 30, 2016, Unit 2 diesel generator A, sheared support bolt for the fuel oil head tank

The inspectors reviewed the extent of condition of possible common cause SSC failures and evaluated the adequacy of the licensee's corrective actions. The inspectors reviewed the licensee's work practices to evaluate whether these may have played a role in the degradation of the SSCs. The inspectors assessed the licensee's characterization of the degradation in accordance with 10 CFR 50.65 (the Maintenance Rule), and verified that the licensee was appropriately tracking degraded performance and conditions in accordance with the Maintenance Rule.

These activities constituted completion of two maintenance effectiveness samples, as defined in Inspection Procedure 71111.12.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed four risk assessments performed by the licensee prior to changes in plant configuration and the risk management actions taken by the licensee in response to elevated risk:

- February 8, 2016, Unit 1 weekly risk assessment
- February 15-21, 2016, Unit 3 work week 1607 risk assessment
- February 29, 2016, Unit 1 weekly risk assessment during train A super outage
- March 30, 2016, Unit 2 diesel generator B during the super outage

The inspectors verified that these risk assessment were performed timely and in accordance with the requirements of 10 CFR 50.65 (the Maintenance Rule) and plant procedures. The inspectors reviewed the accuracy and completeness of the licensee's risk assessments and verified that the licensee implemented appropriate risk management actions based on the result of the assessments.

Additionally, on March 16, 2016, the inspectors observed portions of one emergent work activity that had the potential to affect the functional capability of mitigating systems:

- March 16, 2016, Unit 2 risk assessment revision due to discovery sheared bolt on diesel generator A fuel oil head tank

The inspectors verified that the licensee appropriately developed and followed a work plan for these activities. The inspectors verified that the licensee took precautions to minimize the impact of the work activities on unaffected structures, systems, and components (SSCs).

These activities constitute completion of five maintenance risk assessments and emergent work control inspection samples, as defined in Inspection Procedure 71111.13.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed seven operability determinations that the licensee performed for degraded or nonconforming structures, systems, or components (SSCs):

- January 8, 2016, Unit 3 venturi fouling factor adjustment following the steam generator #1 ultrasonic flow meter failure
- February 1, 2016, Unit 2 diesel generator A for non-qualified spray pond piping configuration
- February 2, 2016, Unit 3 steam supply valve to auxiliary feedwater pump A
- February 2, 2016, Unit 3 diesel generator A for leaking roof hatch
- February 2, 2016, Unit 2 essential cooling water surge tank A automatic makeup valve leaking by
- February 17, 2016, Unit 1 spray pond B return piping wall thinning
- March 2, 2016, Unit 2 auxiliary feedwater pump A trip/throttle valve for loose mounting bolt

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded SSC to be operable, the inspectors verified that the licensee's compensatory measures were appropriate to provide reasonable assurance of operability. The inspectors verified that the licensee had considered the effect of other degraded conditions on the operability of the degraded SSC.

These activities constitute completion of seven operability and functionality review samples, as defined in Inspection Procedure 71111.15.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Temporary Modifications

a. Inspection Scope

On March 3, 2016, the inspectors reviewed one temporary plant modification that affected risk-significant structures, systems, and components (SSCs): Unit 1 temporary spray pond piping configuration during diesel generator outage.

The inspectors verified that the licensee had installed this temporary modification in accordance with technically adequate design documents. The inspectors verified that this modification did not adversely impact the operability or availability of affected SSCs. The inspectors reviewed design documentation and plant procedures affected by the modification to verify the licensee maintained configuration control.

These activities constitute completion of one sample of temporary modifications, as defined in Inspection Procedure 71111.18

b. Findings

No findings were identified.

.2 Permanent Modifications

a. Inspection Scope

On March 15, 2016, the inspectors reviewed one permanent plant modification that affected risk-significant structures, systems, and components (SSCs): Unit 3 main steam isolation valve 181 actuator B air supply line vibration dampener.

The inspectors reviewed the design and implementation of the modification. The inspectors verified that work activities involved in implementing the modification did not adversely impact operator actions that may be required in response to an emergency or other unplanned event. The inspectors verified that post-modification testing was adequate to establish the operability of the SSC as modified.

These activities constitute completion of one sample of permanent modifications, as defined in Inspection Procedure 71111.18.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed seven post-maintenance testing activities that affected risk-significant structures, systems, or components (SSCs):

- February 9, 2016, Unit 1 diesel generator A, air compressor B
- February 11, 2016, station blackout generator #2 following rebuild of pre-lube motor
- March 1, 2016, Unit 1 essential chiller A, following replacement of temperature controllers
- March 5, 2016, Unit 1 diesel generator A, following maintenance outage
- March 16, 2016, Unit 2 diesel generator A, following replacement of fuel oil head tank bolts
- March 19, 2016, Unit 1 charging pump B, following 12 month and 24 month preventive maintenance activities
- March 30, 2016, Unit 2 diesel generator B following super outage

The inspectors reviewed licensing- and design-basis documents for the SSCs and the maintenance and post-maintenance test procedures. The inspectors observed the performance of the post-maintenance tests to verify that the licensee performed the tests in accordance with approved procedures, satisfied the established acceptance criteria, and restored the operability of the affected SSCs.

These activities constitute completion of seven post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed five risk-significant surveillance tests and reviewed test results to verify that these tests adequately demonstrated that the structures, systems, and components (SSCs) were capable of performing their safety functions:

In-service tests:

- January 25, 2016, Unit 3 auxiliary feedwater train B inservice test

Other surveillance tests:

- January 18, 2016, Unit 3 diesel generator B surveillance test
- February 17, 2016, Unit 2 diesel generator B surveillance test
- March 14, 2016, Unit 3 control element assembly operability check
- March 17, 2015, Unit 1 diesel generator B surveillance test

The inspectors verified that these tests met technical specification requirements, that the licensee performed the tests in accordance with their procedures, and that the results of the test satisfied appropriate acceptance criteria. The inspectors verified that the licensee restored the operability of the affected SSCs following testing.

These activities constitute completion of five surveillance testing inspection samples, as defined in Inspection Procedure 71111.22

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

On March 1, 2016, the inspectors observed an emergency preparedness drill to verify the adequacy and capability of the licensee's assessment of drill performance. The inspectors reviewed the drill scenario, observed the drill from the TSC, and attended the post-drill critique. The inspectors verified that the licensee's emergency classifications, off-site notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any emergency preparedness weaknesses were appropriately identified by the licensee in the post-drill critique and entered into the corrective action program for resolution.

These activities constitute completion of one emergency preparedness drill observation sample, as defined in Inspection Procedure 71114.06.

b. Findings

No findings were identified.

.2 Training Evolution Observation

a. Inspection Scope

On January 27, 2016, the inspectors observed simulator-based licensed operator requalification training that included implementation of the licensee's emergency plan. The inspectors verified that the licensee's emergency classifications, off-site

notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any emergency preparedness weaknesses were appropriately identified by the evaluators and entered into the corrective action program for resolution.

These activities constitute completion of one training observation sample, as defined in Inspection Procedure 71114.06

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Public Radiation Safety and Occupational Radiation Safety

2RS2 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

The inspectors assessed licensee performance with respect to maintaining individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors performed this portion of the attachment as a post-outage review. During the inspection the inspectors interviewed licensee personnel, reviewed licensee documents, and evaluated licensee performance in the following areas:

- Radiological work planning, including work activities of exposure significance, and radiological work planning ALARA evaluations, initial and revised exposure estimates, and exposure mitigation requirements. The inspectors also verified that the licensee's planning identified appropriate dose reduction techniques, reviewed any inconsistencies between intended and actual work activity doses, and determined if post-job (work activity) reviews were conducted to identify lessons learned.
- Verification of dose estimates and exposure tracking systems including the basis for exposure estimates, and measures to track, trend, and if necessary reduce occupational doses for ongoing work activities. The inspectors evaluated the licensee's method for adjusting exposure estimates and reviewed the licensee's evaluations of inconsistent or incongruent results from the licensee's intended radiological outcomes.
- Problem identification and resolution for ALARA planning and controls. The inspectors reviewed audits, self-assessments, work-in-progress and post-job ALARA reviews, and corrective action program documents to verify problems were being identified and properly addressed for resolution.

These activities constitute completion of two of the five required samples of occupational ALARA planning and controls as defined in Inspection Procedure 71124.02.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04)

a. Inspection Scope

The inspectors evaluated the accuracy and operability of the licensee's personnel monitoring equipment, verified the accuracy and effectiveness of the licensee's methods for determining total effective dose equivalent, and verified that the licensee was appropriately monitoring occupational dose. The inspectors interviewed licensee personnel, walked down various portions of the plant, and reviewed licensee performance in the following areas:

- External dosimetry accreditation, storage, issue, use, and processing of active and passive dosimeters
- The technical competency and adequacy of the licensee's internal dosimetry program
- Adequacy of the dosimetry program for special dosimetry situations such as declared pregnant workers, multiple dosimetry placement, and neutron dose assessment
- Audits, self-assessments, and corrective action documents related to dose assessment since the last inspection

These activities constituted five occupational dose assessment samples, as defined in Inspection Procedure 71124.04.

b. Findings

Introduction. The inspectors reviewed a self-revealing non-cited violation (NCV) of 10 CFR 20.1701 of very low safety significance (Green) associated with the licensee's failure to implement adequate processes or other engineering controls, to the extent practical, to control the concentration of radioactive material in air. Specifically, the licensee failed to mist and bag a High Efficiency Particulate Air (HEPA) ventilation unit component, use lapel samplers, complete breathing zone air samples, and use an appropriate radiation exposure permit (REP) task. These failures led to an airborne radioactivity condition that resulted in two workers having intakes resulting in internal exposures of 15.2 millirem and 9.7 millirem, respectively.

Description. On April 14, 2015, during Refueling Outage 18 for Unit 3, two radiation protection technicians (RPTs) (one senior and one junior) were assigned to change out the pre-filter for a HEPA stationed on the 100-foot level of the steam generator platform. Although the assigned RPTs had performed this job in the past, the filter change out activity was normally performed by decontamination technicians with RPT oversight. However, the RPTs were confident that they could complete the assigned task without an issue, and the radiation protection (RP) supervisor approved.

The tasks included removing the filter, misting it, bagging it, and disposing of the filter. However, the same radiological and engineering controls were not implemented for the radioactive Y-connector that was also removed from the HEPA. The two RPTs signed

onto REP 3-3306, Task 1, which was categorized as low radiological risk. This task allowed the technicians to complete vacuum change outs, transport vacuums, and other tasks authorized by an RP Leader. The task did not specify HEPA maintenance. The HEPA maintenance was specified on Task 31 of this REP, which was categorized as a medium radiological risk job. Task 1 of REP 3-3306 stated that continuous RP coverage was required for change outs and identified numerous hold points for specific RP Leader approval.

One of those hold points stated that “No vacuum bag change out greater than 100 mrem/hr at 30 cm on this task.” It also stated that “DECON/DIRECT HANDLING OF ITEMS > or = 1,000 mrem/hr on contact requires RP Leader authorization.” The filter removed from the HEPA was surveyed and measured 1,500 millirem per hour on contact and 160 millirem per hour at 30 cm. Thus, based on the RP hold points for Task 1, this job should have stopped for further RP Leader approval. Based on the identified dose rates on the filter, additional radiological and engineering controls should have been administered to the tasks and increased risk. The inspectors also noted that this task did allow high radiation area entry.

The licensee confirmed in their post-evaluation that lapel samplers should have been worn by the RPTs. In addition, breathing zone air samples should have been taken to evaluate the airborne radioactivity in the work area once the pre-filter and aluminum Y-connector were removed from the HEPA unit. These measures would have monitored the airborne radioactivity concentration that the RPTs were breathing. Thus, the RPTs failed to gain additional RP Leader approval for handling the high dose components (filter and Y-connector), failed to wear lapel air samplers, failed to conduct breathing zone air samples, and failed to sign in on the appropriate REP task.

Although the RPTs were incorrectly signed onto Task 1 of the REP, the inspectors reviewed the TEDE-ALARA evaluation for Task 31 of REP 2-3306 provided by the licensee. The evaluation estimated that the use of respirators would increase the external dose to workers performing duties under this activity by nearly 14 percent. Thus, respirators were not required for the task. However, the licensee stated that internal dose for this evolution was estimated by the evaluation to be 3 millirem, on average. The NRC inspectors determined that the estimated internal dose (3 millirem) was not specifically documented in the evaluation reviewed. However, the RPTs assigned to perform the HEPA pre-filter change out were not signed onto Task 31 of REP 3-3306, but rather on Task 1 of this REP, which did not have a TEDE-ALARA evaluation. The inspectors determined the 15.2 millirem CEDE (for the senior RPT) and 9.7 millirem CEDE (for the junior RPT) intakes were unintended or unplanned dose.

The licensee was alerted to this issue when the two RPTs exited the radiologically controlled area and alarmed the PM12 portal monitors. The licensee took immediate corrective actions and instructed these individuals to report to dosimetry for monitoring, re-surveyed the areas, and conducted an extensive evaluation of the issue. The licensee entered this issue into their corrective action program as CR16-01093.

Analysis. The failure to implement adequate engineering and radiological controls during HEPA maintenance in accordance with procedures and the radiological exposure permit requirements was a performance deficiency. The performance deficiency was more than minor because it was associated with the Occupational Radiation Safety attribute of Program and Process and adversely affected the cornerstone objective to

ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. This was evident by two workers receiving unplanned intakes. Using IMC 0609, Appendix C, Occupational Radiation Safety Significance Determination Process, issue date 8/19/2008, the finding was determined to be of very low safety significance (Green) because it did not involve: (1) as low as reasonably achievable (ALARA) planning and controls, (2) an overexposure, (3) a substantial potential for an overexposure, or (4) an impaired ability to assess dose. The inspectors concluded that the finding has a Conservative Bias cross-cutting aspect in the Human Performance area because the licensee failed to use decision-making practices that emphasized prudent choices over those that are simply allowable when they changed out the HEPA pre-filter and Y-connector components [H.14].

Enforcement. Title 10 CFR 20.1701 states, in part, that the licensee shall use, to the extent practical, process or other engineering controls to control the concentration of radioactive material in air. Contrary to the above, on April 14, 2015, the licensee failed to use, to the extent practical, process or other engineering controls to control the concentration of radioactive material in air. Specifically, the licensee failed to use the correct REP task and follow the requirements of the assigned REP, mist and bag the Y-connector of the HEPA, wear lapel samplers, and collect/analyze breathing zone air samples. Consequently, the failure to use adequate radiological and engineering controls resulted in two unplanned intakes. The licensee took immediate corrective actions and instructed the workers to report to dosimetry for monitoring, re-surveyed the areas, and conducted extensive evaluation of the issue. Due to these actions and no potential for overexposures, this issue was not identified as an immediate safety concern. Because the violation is of very low safety significance (Green) and the licensee has entered the issue into their corrective action program as CR-1601093, this violation is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000530/2016001-01, "Failure to use adequate engineering and radiological controls resulting in two unplanned intakes."

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Scrams per 7000 Critical Hours (IE01)

a. Inspection Scope

The inspectors reviewed licensee event reports (LERs) for the period of January, 1, 2015, through December 31, 2015 to determine the number of scrams that occurred. The inspectors compared the number of scrams reported in these LERs to the number reported for the performance indicator. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the data reported.

These activities constituted verification of the unplanned scrams per 7000 critical hours performance indicator for Units 1, 2, and 3 respectively, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 Unplanned Power Changes per 7000 Critical Hours (IE03)

a. Inspection Scope

The inspectors reviewed operating logs, corrective action program records, and monthly operating reports for the period of January, 1, 2015, through December 31, 2015, to determine the number of unplanned power changes that occurred. The inspectors compared the number of unplanned power changes documented to the number reported for the performance indicator. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the data reported.

These activities constituted verification of the unplanned power outages per 7000 critical hours performance indicator for Units 1, 2, and 3 respectively, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.3 Unplanned Scrams with Complications (IE04)

a. Inspection Scope

The inspectors reviewed the licensee's basis for including or excluding in this performance indicator each scram that occurred January, 1, 2015, through December 31, 2015. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the data reported.

These activities constituted verification of the unplanned scrams with complications performance indicator for Units 1, 2, and 3 respectively, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.4 Safety System Functional Failures (MS05)

a. Inspection Scope

For the period of January, 1, 2015, through December 31, 2015, the inspectors reviewed licensee event reports (LERs), maintenance rule evaluations, and other records that

could indicate whether safety system functional failures had occurred. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, and NUREG-1022, "Event Reporting Guidelines: 10 CFR 50.72 and 50.73," Revision 3, to determine the accuracy of the data reported.

These activities constituted verification of the safety system functional failures performance indicator for Units 1, 2, and 3 respectively, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

40A2 Problem Identification and Resolution (71152)

.1 Routine Review

a. Inspection Scope

Throughout the inspection period, the inspectors performed daily reviews of items entered into the licensee's corrective action program and periodically attended the licensee's condition report screening meetings. The inspectors verified that licensee personnel were identifying problems at an appropriate threshold and entering these problems into the corrective action program for resolution. The inspectors verified that the licensee developed and implemented corrective actions commensurate with the significance of the problems identified. The inspectors also reviewed the licensee's problem identification and resolution activities during the performance of the other inspection activities documented in this report.

b. Findings

No findings were identified.

.2 Annual Follow-up of Selected Issues

a. Inspection Scope

The inspectors selected two issues for an in-depth follow-up:

- On February 10, 2016, Unit 2 Class 1E inverter failure apparent cause evaluation report
- March 17, 2016, Unit 2 pressurizer level control exceed the high level limit resulting from control valve maintenance

The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews and compensatory actions. The inspectors verified that the licensee appropriately prioritized the planned corrective actions and that these actions were adequate to correct the condition.

These activities constitute completion of two annual follow-up samples as defined in Inspection Procedure 71152.

b. Findings

No findings were identified.

40A3 Follow-up of Events and Notices of Enforcement Discretion (71153)

These activities constitute completion of one event follow-up sample, as defined in Inspection Procedure 71153.

.1 (Closed) Licensee Event Report 05000530/2015-004-01, Condition Prohibited by Technical Specification 3.0.4 and 3.7.2 Due to an Inoperable Main Steam Isolation Valve

a. Event Summary

On August 13, 2015, at approximately 9:06 p.m., the Unit 3 main steam isolation valve 181 (MSIV-181) actuator B was declared inoperable and Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.2, Condition A, was entered due to a failed fitting on the air supply line. To correct the condition the failed fitting was replaced and an additional pipe support was installed on the air-line. Following retests, the MSIV-181 actuator B was restored to operable status and LCO 3.7.2, Condition A, was exited on August 15, 2015 at approximately 6:30 p.m. On May 19, 2015, a similar air-line fitting failure had occurred on the same component.

The licensee's investigation of this condition following the second failure determined the MSIV-181 actuator B air-line configuration was modified in the spring 2015 refueling outage and was inoperable from Mode 4 entry on May 1, 2015, at 2:58 a.m., following the outage because the air-line tubing was not adequately supported following the design change. The licensee also found that a lack of a local visual inspection of actual plant conditions resulted in the excessive vibration remaining unnoticed prior to the component failure. The excessive vibration ultimately caused the fitting on the air supply line to fail resulting in the inoperability of the MSIV-181 actuator B. The inspectors reviewed the licensee event report and dispositioned this issue as a self-revealing non-cited violation. This licensee event report is closed.

b. Findings

Introduction. The inspectors reviewed a Green self-revealing non-cited violation of Technical Specification 3.7.2 Condition A for exceeding the allowed outage time of seven days. Specifically, Unit 3's MSIV-181 actuator B was found to be inoperable from May 1, 2015, until August 15, 2015, when a design change installed a new swivel type fitting on an air-line without taking into account vibrational forces. This eventually caused a fatigue failure of the fitting, depressurizing the accumulator B to below 5000 psig.

Description. During the April 2015, Unit 3 refueling outage, the licensee implemented a design change which was to install a new type of swivel fitting on the air line to MSIV-181 actuator B. The purpose of this change was to facilitate online maintenance by replacing the rigid type fittings with swivel type fittings. As part of the design change process, the station procedure, 81DP-0EE10 "Design Change Process", requires that

special mechanical requirements such as vibrations be identified and addressed. The design change documentation noted no impact to any special mechanical requirements. Unit 3 completed their refueling outage and entered Mode 1 on May 3, 2015.

On May 19, 2015, at 4:23 a.m., the Unit 3 control room received alarms when the MSIV-181 accumulator B pressure unexpectedly dropped below 5000 psig. The operators entered Technical Specification 3.7.2 Condition A for an inoperable actuator train on one MSIV. Field operators found that the new swivel type fitting had completely sheared resulting in an air leak from accumulator B. Accumulator A was unaffected. The failed fitting was repaired and restored to an operable status later the same day. Additionally the licensee initiated a level 2 cause evaluation for the component failure.

During a visual walkdown of the affected air supply line, engineers noted excessive vibrations. A walkdown other air supply lines did not exhibit such vibration. A vibrational analysis was performed and determined that the tubing would be susceptible to fatigue failure. Engineering analysis concluded the fitting would last for approximately 300 days under this cyclical load. However a second fitting failure occurred on August 13, 2015, to the same fitting. The senior reactor operator declared MSIV-181 "B" accumulator inoperable and entered Technical Specification Action Statements 3.7.2 Condition A for an inoperable actuator train. In addition to replacing the fitting a second time, the licensee added supports to the airline to dampen vibrations. The Unit 3 senior reactor operator declared MSIV-181 operable on August 15, 2015.

The licensee's cause evaluation found that no physical walkdown was performed to determine special mechanical requirements as required in step J.2.9.1 of procedure 81DP-0EE10, "Design Change Process." A past operability evaluation concluded that MSIV-181 accumulator B was inoperable from May 1, 2015, until August 15, 2015. Additionally Technical Specification Limiting Condition for Operability 3.0.4 was not met due to entry into Mode 4 with an LCO not met and the conditional requirements of LCO 3.0.4 also not met.

Analysis. The failure to take into account excessive vibrational stresses as required by procedure 81DP-0EE10, "Design Change Process" step J.2.9.1, when implementing the design change to an air-line fitting was a performance deficiency. The performance deficiency was more-than-minor and therefore a finding because it affected the equipment performance attribute of the Mitigating Systems Cornerstone to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically the failure to account for the vibrational stresses resulted in the fatigue failure of the air-line fitting depressurizing one of two hydraulic accumulators thereby reducing the reliability of the system to initiate a fast closure of MSIV-181 upon receipt of a Main Steam Isolation Signal. The inspectors performed the initial significance determination using NRC Inspection Manual 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," Issue Date: 06/19/12. The finding screened as Green since the MSIV remained capable of performing its safety function with the alternate accumulator. The finding has a cross-cutting aspect in the area of human performance associated with the "avoid complacency" component. Specifically the licensee assumed there were no factors affecting the mechanical design requirements beyond the performance requirements. As a result the licensee failed to perform a thorough review of the mechanical conditions (such as vibrations) the airline was subjected. [H.12]

Enforcement. Technical Specification 3.7.2 requires that all four Main Steam Isolation Valves (MSIVs) and their associated actuator trains shall be operable. Condition A allows a single accumulator to be inoperable for a period of 7 days. Contrary to the above a past operability determination found that Unit 3's MSIV-181 actuator B was inoperable from May 1, 2015, to August 15, 2015. The inoperability of the actuator B was the result of the licensee failing to account for vibrational stresses when implementing a design change of an air-line fitting. The vibrational stresses eventually caused the fatigue failure of the fitting resulting in the depressurization of the hydraulic accumulator B rendering it inoperable. The licensee's immediate corrective actions were to install additional supports to dampen the vibrations of the air line and conducted an inspection for excessive vibrations on the other pneumatic lines to ensure the problem does not exist on any other plant components. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as Condition Report 15-02686, this violation is being treated as a non-cited violation in accordance with Section 2.3.2 of the Enforcement Policy: NCV 05000530/2016001-02, "Fatigue failure of a pneumatic fitting due to excessive vibrations."

40A6 Meetings, Including Exit

Exit Meeting Summary

On January 22, 2016, the inspectors presented the radiation safety inspection results to Mr. G. Andrews, Director of Nuclear Regulatory Affairs, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On April 6, 2016, the inspectors presented the inspection results to R. Bement, M. Lacal, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

40A7 Licensee-Identified Violations

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

- Technical Specification 5.4.1, "Procedures," requires that procedures be established, implemented, and maintained covering the applicable procedures in Regulatory Guide 1.33. Regulatory Guide 1.33, Appendix A, Section 9 requires, in part, that maintenance that can affect the performance of safety-related equipment be properly preplanned and performed in accordance with written procedures. Contrary to the above, prior to October 1, 2015, licensee work management personnel failed to perform an activity affecting quality in accordance with written procedures.

Specifically, the licensee did not conduct an adequate review of technical specification LCO implications of a planned Unit 2 essential spray pond outage in accordance with procedure 51DP-9OM08, "Look Ahead Process." Work planners did not recognize that the removal of two spray pond piping spool pieces was an activity required to restore spray pond system operability and therefore did not establish a tracking mechanism to ensure that the spool pieces were removed before the Unit 2 essential spray pond A was

declared operable. Consequently, the Unit 2 essential spray pond A would not have been able to provide cooling to the essential cooling water heat exchanger following a seismic event. The inspectors evaluated the significance of the issue under the Significance Determination Process, as defined in Inspection Manual Chapter 0609.04, "Initial Characterization of Findings," and 0609 Appendix A, "The Significance Determination Process (SDP) for Findings at-Power," dated June 19, 2012. Inspectors concluded the finding was of very low safety significance (Green) because all questions in Exhibit 2 could be answered no. The licensee entered the issue into the corrective action program as CR 15-08352. The licensee now plans and controls the removal and re-installation of spray pond spool pieces using the station's temporary modification process.

ATTACHMENT 1

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

R. Bement, Sr. Vice President of Nuclear Operations
M. Lecal, Sr. Vice President of Regulatory and Oversight
J. Cadogan, Vice President, Engineering
C. Kharrl, Plant General Manager for Operations
M. McLaughlin, Plant General Manager of Site Support
D. Vogt, Assistant Plant Manager Unit 2
D. Wilson, Shift Manager
H. Ridenour, Director Maintenance
G. Andrews, Director Regulatory Affairs
D. Wheeler, Director Performance Improvement
K. Graham, Director Plant Engineering
K. House, Director Design Engineering
M. McGhee, Department Leader, Nuclear Regulatory Affairs
J. Glass, Department Leader, Performance Improvement
M. Radspinner, Department Leader, System Engineering
R. Tremayne, Department Leader, Work Management
M. Hooshmand, Department Leader, Nuclear Assurance
G. Cameron, Section Leader, Nuclear Regulatory Affairs
H. Lesan, Section Leader, Performance Improvement
L. McKinney, Section Leader, Security
J. Rodriguez, Compliance Engineer
S. Dornseif, Compliance Engineer
C. Stephenson, Licensing Engineer
J. Bungard, Superintendent, Technical Support (Acting)
T. Dickinson, Unit 3 RMC Supervisor, Radiation Protection
D. Heckman, Senior Compliance Consultant, Regulatory Affairs
G. Jones, Supervisor, Radiation Protection
S. Lantz, Dosimetry Section Leader, Radiation Protection
C. Moeller, Director, Technical Support (Acting)
R. Routolo, Manager, Radiation Protection (Acting)
M. Wagner, Supervisor, ALARA and Radiation Protection

NRC Personnel

C. Peabody, Senior Resident Inspector
D. Reinert, Resident Inspector
D. You, Resident Inspector
L. Carson II, Senior Health Physicist
N. Greene, PhD. Health Physicist

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000530/2015-004-01	LER	Condition Prohibited by Technical Specifications 3.0.4 and 3.7.2 due to an inoperable main steam isolation valve (Section 4OA3.1)
05000530/2016001-01	NCV	Failure to use adequate engineering and radiological controls resulting in two unplanned intakes
05000530/2016001-02	NCV	Fatigue failure of pneumatic fitting due to excessive vibrations

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40OP-9PB01	4.16kV Class 1E Power (PB)	31
40OP-9DG02	Emergency Diesel Generator B	73
40OP-9DF01	Diesel Fuel Oil Storage and Transfer (DF)	42
40OP-9EC02	Essential Chilled Water Train B	29
40OP-9EC02	Essential Chilled Water Train A	30

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	System Health Report – Essential Chilled Water	September 30, 2015

Section 1R05: Fire Protection

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40AO-9ZZ19	Control Room Fire	31
14OP-9FP02	CO2 Fire Protection (CARDOX)	9
18FT-9FP39	Functional Test of Appendix A Fire/HELB Doors	0

Condition Reports (CRs)

16-02078

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Pre-Fire Strategies Manual	25
	PVNGS Updated FSAR	18
	Pre-Fire Strategies Manual	25
13-VTD-C285-0005-1	Chemtron Low Pressure Carbon Dioxide Systems, Operation & Maintenance Manual, [PUB # 11B]	
85-FP-110	Engineering Evaluation Request	November 16, 2015

Section 1R06: Flood Protection Measures

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
13-MC-ZY599	Essential Pipe Density Tunnel Flooding	

Section 1R11: Licensed Operator Requalification Program and Licensed Operator Performance

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
40DP-9OP02	Conduct of Shift Operations	68
SES-0-03-Q-09	Licensed Operator Continuing Training Simulator Evaluation Scenario	December 22, 2015

Section 1R12: Maintenance Effectiveness

Condition Reports (CRs)

15-07224 16-01437

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
CH-1203	Maintenance Rule (a)(1) Issue Tracking Form	6
	System Health Report	Q4-2015
	System Health Report – Diesel Generator	Q4-2015
	Unit 2 Maintenance Rule SSC Unavailability Report	March 3, 2016
	Palo Verde Maintenance Rule Manager Database	

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40ST-9EC03	Essential Chilled Water and Ventilation Systems Inoperable Actions Surveillance	20
70DP-0RA01	Shutdown Risk Assessments	50

Condition Reports (CRs)

16-02709 16-04066

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Scheduler's Evaluation for PV Unit 1	February 7, 2016
	Scheduler's Evaluation for PV Unit 1	February 29, 2016
	Scheduler's Evaluation for PV Unit 2	March 16, 2016
	Scheduler's Evaluation for PV Unit 2	March 24, 2016

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40OP-9ZZ05	Power Operations	143
40DP-9OP26	Operations Condition Reporting Process and Operability Determination/Functional Assessment	42

Condition Reports (CRs)

15-13087 16-00265 15-08352-002 15-08352 16-01578
06-02062 15-10486 15-10883 15-10418 16-00245
16-02578 16-01561 16-03246

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
4732426	Engineering Evaluation	January 6, 2016
M018-00322	Lube Oil Circulation Pump Motor Data	
13-MC-ZZ-0217	Engineering Calculation	7

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
4740953	Engineering Evaluation	
4723071	Engineering Evaluation	
4749946	Engineering Evaluation	

Section 1R18: Plant Modifications

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
81DP-0DC17	Temporary modification Control	36

Work Orders

4745046

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
4435636	Design Equivalent Change: Alternate Air Fitting for MSIV/FWIV Air check Valve Connection to Manifold	3

Section 1R19: Post-Maintenance Testing

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40ST-9GT03	Station Blackout Generator 2 Monthly Test	6
40ST-9DG01	Diesel Generator A Test	45
73ST-9CH06	Charging Pumps – Inservice Test	26
40ST-9DG02	Diesel Generator B Test	49

Condition Reports (CRs)

16-04066 16-04136 16-04152

Work Orders

4743659	4592359	4754245	4754870	4580405
4603460	4486471	4542945	4542965	4732477
4479572	4725145			

Section 1R22: Surveillance Testing

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
73ST-9SG08	Class 1E Diesel Generator Load Rejection, 24 Hour Rated Load and Hot Start Test Train B	10
73ST-9AF03	Auxiliary Feedwater B – Inservice Test	27
40ST-9DG02	Diesel Generator B Test	49
40ST-9SF01	CEA operability check	35

Work Orders

4575857	4580516	4589871
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Section 1EP6: Drill Evaluation

Procedures

<u>Number</u>	<u>Title</u>	<u>Date</u>
SES-0-03-Q-09	Licensed Operator Continuing Training Simulator Evaluation Scenario	December 22, 2015

Section 2RS2: Occupational ALARA Planning and Controls

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
74CH-9XC73	Tritium	05
75DP-0RP06	ALARA Committee	06
75DP-0RP08	Managing Radiological Risk	02
75RP-9RP02	Radiation Exposure Permits	29
75RP-9RP12	ALARA Reports	05
75RP-9RP28	Radioactive Process Filter Management	06
75TD-9RP02	ALARA Work Planning	08
75RP-9RP25	Temporary Shielding	14
75TD-9RP04	Operations Manual	06

Radiation Exposure Permits

<u>Number</u>	<u>Title</u>	<u>Revision</u>
1-3306	Primary Side Steam Generator Maintenance	01
3-3002	Reactor Destack and Restack	04
9-1021	LR Evaporator & BAC System Maintenance	03

Radiation Exposure Permits

<u>Number</u>	<u>Title</u>	<u>Revision</u>
9-1105	Fuel Handling	01
1-3003	Reactor Vessel Head (RVH) O-Ring Maintenance and Flange Inspection	03
2-3509	Contamination Control Outage Tasks	05
3-3306	Primary Side Steam Generator Maintenance	06

Palo Verde Condition Reports

1601058	1510580	1508339	1508336	1505025
1504942	1504939	1503936	1503147	1503090
1502333	1502221	1502040	1502034	

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Unit-3 3R18 Outage Report	June 18, 2015
	ALARA 5 Year Plan 2015 - 2019	November 7, 2015
PCR 4677906	UFSAR Section 12 Per Dry Cask Special Tools	November 20, 2015
DMWO 4304156	ALARA Design Review HPSI Piping	December 9, 2013
	Unit-2 2R19 Outage Report	December 22, 2015
	Radiological Safety Trends	December 31, 2015

Audits, Self-Assessments, and Surveillances

<u>Number</u>	<u>Title</u>	<u>Date</u>
	2014 Annual ALARA/Management Evaluation Report	June 29, 2015

Section 2RS4: Occupational Dose Assessment

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
75DP-0RP01	RP Program Overview	11
75DP-0RP06	Managing Radiological Risk	02
75RP-9ME21	TLD Issue, Exchange and Termination	13
75RP-9ME23	Exposure Evaluation for Lost, Damaged, or Suspect Dosimetry, and Anticipated EPD Dose Rate Alarm	12
75RP-9ME24	Dosimetry Processing, Evaluation, and Documentation	05
75RP-9ME25	TLD Reader Calibration and Response Check	06
75RP-9RP02	Radiation Exposure Permits	29
75RP-9RP03	Bioassay Analysis	10
75RP-9RP05	Contamination Dose Evaluation	07
75RP-9RP16	Special Dosimetry	20

Audits, Self-Assessments, And Surveillances

<u>Number</u>	<u>Title</u>	<u>Date</u>
100536-0	NVLAP Onsite Assessment Summary	May 6, 2014
218-03732-TSG/GRN	2013 Annual Radiation Protection Program Summary Report	May 30, 2014

Palo Verde Condition Reports

1501820	1502248	1503644	1505076	1507237
1508308	1508385	1508590	1508823	1509662
1509732	1510410	1510844	1510977	1511554
1511845	1601093			

Radiation Exposure Permits (REPs)

<u>Number</u>	<u>Title</u>	<u>Revision</u>
1-3003	Reactor Vessel Head (RVH) O-Ring Maintenance and Flange Inspection	03
2-3509	Contamination Control Outage Tasks	05
3-3306	Primary Side Steam Generator Maintenance	06

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Dosimetry Program Quality Manual	16
	Dosimetry Comparison Failures	2015
100536-0/F, G	2014 NVLAP Proficiency Testing Report	June 13, 2014
2-3306-31	TEDE/ALARA Evaluation	July 23, 2015
100536-0/H, I	2014 NVLAP Proficiency Testing Report	August 15, 2014
TLD Reader No. 468119	TLD Reader Calibration and Response Check	September 24, 2015
100536-0	NVLAP Certificate of Accreditation to ISO/IEC 17025:2005	October 1, 2015
	Waste Stream Report: Unit 1 Dry Active Waste	January 5, 2016
	Waste Stream Report: Unit 2 Dry Active Waste	January 5, 2016
	Waste Stream Report: Unit 3 Dry Active Waste	January 5, 2016
218-03946- JER	Fourth Quarter 2015 ISFSI Area TLD Monitoring Results	January 7, 2016
TLD Reader No. 256069	TLD Reader Calibration and Response Check	January 15, 2016

Section 40A1: Performance Indicator Verification

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision</u>
NEI 99-02	Regulatory Assessment Performance Indicator Guideline	7

Section 40A2: Problem Identification and Resolution

Condition Reports (CRs)

4654418 4639503 4650188 4650483

Attachment 2

**The following items are requested for the
Occupational Radiation Safety Inspection
Integrated Report 2016-001
at
Palo Verde Nuclear Station
(January 19-22, 2016)**

Inspection areas are listed in the attachments below.

Please provide the requested information on or before January 8, 2016

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.01 should be in a file/folder titled "1- A," applicable organization charts in file/folder "1- B," etc.

If information is placed on *ims.certrec.com*, please ensure the inspection exit date entered is at least 30 days later than the onsite inspection dates, so the inspectors will have access to the information while writing the report.

In addition to the corrective action document lists provided for each inspection procedure listed below, please provide updated lists of corrective action documents at the entrance meeting. The dates for these lists should range from the end dates of the original lists to the day of the entrance meeting.

If more than one inspection procedure is to be conducted and the information requests appear to be redundant, there is no need to provide duplicate copies. Enter a note explaining in which file the information can be found.

If you have any questions or comments, please contact Louis Carson at (817)200-1221, Louis.Carson@nrc.gov or Natasha Greene at (817)200-1154, Natasha.Greene@nrc.gov

PAPERWORK REDUCTION ACT STATEMENT

This letter 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.

2. Occupational ALARA Planning and Controls (71124.02)

Date of Last Inspection: April 17, 2015

- A. List of contacts and telephone numbers for ALARA program personnel
- B. Applicable organization charts
- C. Copies of audits, self-assessments, and LERs, written since date of last inspection, focusing on ALARA
- D. Procedure index for ALARA Program
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
 - 1. ALARA Program
 - 2. ALARA Committee
 - 3. Radiation Work Permit Preparation
- F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the ALARA program. In addition to ALARA, the summary should also address Radiation Work Permit violations, Electronic Dosimeter Alarms, and RWP Dose Estimates

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are "searchable" so that the inspector can perform word searches.

- G. List of work activities greater than 1 rem, since date of last inspection
Include original dose estimate and actual dose.
- H. Site dose totals and 3-year rolling averages for the past 3 years (based on dose of record)
- I. Outline of source term reduction strategy
- J. If available, provide a copy of the ALARA outage report for the *most recently* completed outages for each unit
- K. Please provide your most recent Annual ALARA Report.

4. Occupational Dose Assessment (Inspection Procedure 71124.04)

Date of Last Inspection: April 17, 2015

- A. List of contacts and telephone numbers for the following areas:
 - 1. Dose Assessment personnel
- B. Applicable organization charts

- C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:
 - 1. Occupational Dose Assessment
 - D. Procedure indexes for the following areas
 - 1. Occupational Dose Assessment
 - E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
 - 1. Radiation Protection Program
 - 2. Radiation Protection Conduct of Operations
 - 3. Personnel Dosimetry Program
 - 4. Radiological Posting and Warning Devices
 - 5. Air Sample Analysis
 - 6. Performance of High Exposure Work
 - 7. Declared Pregnant Worker
 - 8. Bioassay Program
 - F. List of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, associated with:
 - 1. National Voluntary Laboratory Accreditation Program (NVLAP)
 - 2. Dosimetry (TLD/OSL, etc.) problems
 - 3. Electronic alarming dosimeters
 - 4. Bioassays or internally deposited radionuclides or internal dose
 - 5. Neutron dose
- NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.
- G. List of positive whole body counts since date of last inspection, names redacted if desired
 - H. Part 61 analyses/scaling factors
 - I. The most recent National Voluntary Laboratory Accreditation Program (NVLAP) accreditation report or, if dosimetry is provided by a vendor, the vendor’s most recent results

PAPERWORK REDUCTION ACT STATEMENT

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