



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
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September 21, 2007

Randall K. Edington  
Senior Vice President, Nuclear  
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Arizona Public Service Company  
P.O. Box 52034  
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SUBJECT: PALO VERDE NUCLEAR GENERATING STATION UNITS 1, 2, AND 3 -  
EXAMINATION REPORT 05000528/2007301; 05000529/2007301; AND  
05000530/2007301

Dear Mr. Edington:

On July 27, 2007, the Nuclear Regulatory Commission (NRC) completed an examination at Palo Verde Nuclear Generating Station, Units 1, 2, and 3. The enclosed report documents the examination findings, which were discussed on August 21, 2007, with Mr. Fred Riedel, Director, Nuclear Training Department, and other members of your staff.

The examination included an evaluation of 5 applicants for reactor operator licenses, 3 applicants for instant senior operator licenses, and 2 applicants for upgrade senior operator licenses. The written and operating examinations were developed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9. The license examiners determined that 10 of the 10 applicants satisfied the requirements of 10 CFR Part 55, and the appropriate licenses have been issued.

No findings of significance were identified during this examination.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document 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/

Anthony T. Gody, Chief  
Operations Branch  
Division of Reactor Safety

Arizona Public Service Company

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**U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV**

Dockets: 50-528, 50-529, 50-530  
Licenses: NPF-41, NPF-51, NPF-74  
Report: 05000528/2007301, 05000529/2007301, 05000530/2007301  
Licensee: Arizona Public Service Company  
Facility: Palo Verde Nuclear Generating Station, Units 1, 2, and 3  
Location: 5951 S. Wintersburg Road  
Tonopah, Arizona  
Dates: July 20 through August 21, 2007  
Inspectors: Jim Drake, Chief Examiner, Operations Branch  
Tom McKernon, Senior Operations Engineer  
Kelly Clayton, Senior Operations Engineer  
Approved By: Anthony T. Gody, Chief  
Operations Branch  
Division of Reactor Safety

## SUMMARY OF FINDINGS

ER 05000528/2007301, 05000529/2007301, 05000530/2007301; 07/20-08/21/2007, Palo Verde Nuclear Generating Station Units 1, 2, and 3, Operator Licensing Initial Examination Report.

NRC examiners evaluated the competency of 5 applicants for reactor operator licenses, 3 applicants for instant senior operator licenses, and 2 applicants for upgrade senior operator licenses at Palo Verde Nuclear Generating Station Units 1, 2, and 3. The facility licensee developed the examinations using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9. The written examination was administered by the facility on July 20, 2007. NRC examiners administered the operating test on July 23-27, 2007. The license examiners determined that 10 of 10 applicants passed all portions of the examination.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

No findings of significance were identified.

## Report Details

### 4. OTHER ACTIVITIES (OA)

#### 4OA5 OTHER ACTIVITIES (Initial License Examination)

##### .1 Operator Knowledge and Performance

###### a. Examination Scope

On July 20, 2007, the licensee proctored the administration of the written examinations to all 10 applicants. The licensee staff graded the written examinations, analyzed the results, and presented their analysis to the NRC on August 6, 2007.

The NRC examination team administered various portions of the operating test to all 10 applicants on July 23 to 26, 2007. Most of the reactor operator and instant senior operator applicants participated in two dynamic simulator scenarios, a control room and facilities walkthrough test consisting of 10 system tasks, and an administrative test consisting of 4 administrative tasks for the reactor operator applicants and 5 administrative tasks for the instant senior operator applicants. The 2 applicants upgrading their reactor operator licenses to senior operator licenses participated in one scenario and took a control room and facilities walkthrough test consisting of 5 system tasks. Their administrative test consisted of 5 administrative tasks.

###### b. Findings

Written Test: All of the applicants passed the written examination. For the written examination, the average score for reactor operator applicants was 86.66 percent, and the average score for senior operator applicants was 84.8 percent for the senior operator portion of the examination and 88.8 percent for the combined written examination. The reactor operator applicant scores ranged from 84 to 89.3 percent, and the senior operator applicant scores ranged from 76 to 92 percent for the senior operator portion of the examination and 86 to 92 percent on the combined examination.

Chapter ES-403 and Form ES-403-1 of NUREG 1021 require the licensee to analyze the validity of any written examination questions that were missed by half or more of the applicants. The licensee conducted a performance analysis for the written examination with emphasis on seven questions missed by 50 percent or more of the applicants. The licensee concluded that all questions were valid and conducted the necessary remediation with the applicants. After reviewing the licensee's analysis, the examiners agreed with the licensee's assessment.

Operating Test: The licensing examiners determined that 10 of the 10 applicants passed all portions of the operating examination. During the operating examination, the examiners did not observe any generic weaknesses in operator performance.

The licensee submitted one senior operator administrative job performance measure for a change to the answer key. The licensee provided comments, as well as plant reference material to support their submission. The license examiners reviewed the

comments and material, as well as additional procedures and information provided to determine if any changes to the examination answer key was justified. For the job performance measure submitted, the licensee recommended accepting a site area emergency classification and associated protective action recommendations (PARs) vice the general emergency classification and associated PARs. Provided below is the JPM initiating cue, a summary of the licensee's recommendation and justification, and the examiner's resolution and justification.

SA-5: Initiating Cue:

You are in Unit 1.

A SGTR [steam generator tube rupture] > 200 gpm has occurred.

The crew tripped the reactor.

On the reactor trip a loss of power to the grid occurred.

DG [diesel generator] 'A' did not automatically start.

HPSI [high pressure safety injection] Pump 'B' has a white SEIS [safety equipment inoperable status] light illuminated.

The CRS [control room supervisor] entered the functional recovery procedure.

The crew has restored power to PBA-S03 (electrical bus) using the 'A' DG and has started the A' HPSI pump.

RVLMS [reactor vessel level monitoring system] indicated <21 percent in the outlet plenum 10 minutes ago, but now indicates >21 percent.

The secondary operator has stabilized the secondary plant using AF [auxiliary feedwater] Pump A and the ADVs [atmospheric dump valves].

Your task is to perform the duties of the Emergency Coordinator until relieved.

This is a **time critical** JPM.

**Licensee Comment**

The Initiating cue provided the following pertinent information:

Steam generator tube rupture > 200 gpm

and

The secondary operator has stabilized the secondary plant using Auxiliary Feedwater Pump A and the atmospheric dump valves.

During the validation of the job performance measure it was incorrectly assumed that a loss of the reactor coolant system barrier as defined in Emergency Plan Implementation Procedure (EPIP) 99, "EPIP Standard Appendices," Appendix A, "Emergency Action Levels (EAL) EAL 1-7, steam generator tube rupture > 132 gpm with a prolonged release of contaminated secondary coolant occurring from the ruptured steam generator to the environment had occurred.

However, Precaution and Limitation 1-7 provides the following clarification of what constitutes a "prolonged release" as used in the context of EAL 1-7 for steam generator tube rupture. "As stated in the Fission Product Barrier Emergency Action Level [1-7], a 'prolonged release of secondary coolant' encompasses a main steam line break, feedwater line break, stuck open steam generator safety and/or atmospheric dump valve(s), and plant cooldown (i.e., to Mode 5) while steaming the affected steam generator to atmosphere." Given this definition and that the initiating cue also stated that the plant was stabilized (no cooldown in progress), there was no prolonged release of secondary coolant and no loss of the reactor coolant system barrier as defined in the precaution and limitations associated with the emergency action level. There was, however, a potential loss of reactor coolant system barrier as defined by Emergency Action Level 1-7 since the steam generator tube rupture of > 200gpm met the criteria for a potential loss of the reactor coolant system barrier as defined by Emergency Action Level 1-7, "steam generator tube rupture 44 gpm."

A general emergency requires the loss of any two barriers and the potential loss of a third barrier. This job performance measure had a loss of the containment barrier, but only the potential loss of the reactor coolant system and fuel clad. Therefore, the correct classification for the condition provided in the job performance measure was a site area emergency.

Given this information the correct answer for the job performance measure should be a site area emergency classification and the associated PARs because of a potential loss of both fuel clad and reactor coolant system barrier AND loss of any additional barrier.

### **NRC Resolution**

After a careful review of the applicable documents, the NRC staff concurred with the licensee's recommendation. The job performance measure was corrected to a classification of a site area emergency and the appropriate PARs.

## **.2 Initial Licensing Examination Development**

### **Operating Examination Outline and Examination Package**

#### **a. Examination Scope**

The licensee developed the examinations in accordance with NUREG-1021, Revision 9. Licensee facility training and operations staff involved in examination development was on a security agreement.

The facility licensee submitted the operating examination outlines on April 23, 2007. Examiners reviewed the submittal against the requirements of NUREG-1021, Revision 9, and forwarded comments to the licensee on April 30, 2007. The facility licensee submitted the draft operating and written examination package on June 18, 2007. Examiners reviewed the draft submittals against the requirements of NUREG-1021, Revision 9, and provided comments to the licensee for the draft operating and written examinations on June 23, 2007. The examiners conducted an onsite

validation of the operating examination and provided comments to the licensee during the week of July 09, 2007. The licensee satisfactorily completed comment resolution during the week of July 16, 2007.

b. Findings

Examiners approved the initial examination outline with minor comments and advised the licensee to proceed with the operating examination development.

The chief examiner determined that the operating and written examinations initially submitted by the licensee were within the range of acceptability expected for a proposed examination and were satisfactory after comment resolution.

No findings of significance were identified.

.3 Simulation Facility Performance

a. Examination Scope

The examiners observed simulator performance with regard to plant fidelity and reliability during the examination validation and administration.

b. Findings

No findings of significance were identified.

.4 Examination Security

a. Examination Scope

The examiners reviewed examination security for examination development and during both the onsite preparation week and examination administration week for compliance with NUREG-1021 requirements. Plans for simulator security and applicant control were reviewed and discussed with licensee personnel.

b. Findings

Two potential examination security compromises occurred during examination development. The first potential compromise occurred when the licensee failed to disconnect the simulator feeds to the Emergency Response Data Acquisition and Display System (ERFDADS) terminals in the units before running two of the scenarios for validation. It was determined by the licensee that compromise of the scenarios was unlikely because the ERFDADS terminals at each unit were secured during the time period in question and the data was deleted. The second occurred when a simulator instructor obtained knowledge of the NRC examination under development and instructed a number of initial operator licensee candidates on May 31, 2007. The instructor was debriefed by the licensee's examination development team members. It was determined that his examination knowledge was limited to three job performance measures and that he had not discussed any information related to his examination

knowledge with the students. After debrief, the licensee examination development team was satisfied that no breach of examination security had occurred based on the individual's limited examination knowledge and his specific interaction with the students. These issues were entered into the licensee's corrective action program as Condition Report/Disposition Requests 3003714 and 3023375. The NRC staff determined that these examination security issues were minor.

.5 License Applications

a. Examination Scope

The chief examiner reviewed all 10 preliminary applications and audited 2 of the license applications in accordance with NUREG 1021, Revision 9.

b. Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

Exit Meeting Summary

The examination team presented a debrief to Mr. Pete Borchert, Director Operations Department, and other members of the licensee's management staff at the conclusion of the examinations on July 27, 2007. The licensee acknowledged the findings presented. A subsequent telecommunication exit was conducted with Mr. Fred Riedel, Director, Nuclear Training Department, and other members of your staff on August 21, 2007. The findings as detailed in this report and applicant performance during the examination were discussed.

The licensee did not identify as proprietary any information or materials reviewed during the examination.

4OA7 Licensee - Identified Violations

None.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

Pete Borchert, Director Operations Department  
Fred Riedel, Director Nuclear Training Department  
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Pete McSparran, Operations  
John Cox, Operations  
John Wood, Training  
Alan Malley, Section Leader  
Daniel Marks, Regulatory Affairs  
Dan Hautala, Regulatory Affairs  
Tim Weber, Regulatory Affairs  
Mark McGhee, Operations  
Warren Potter, Training  
Larry Burton, Training

#### **NRC Personnel**

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Kelly Clayton, Senior Operations Engineer