



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
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March 31, 2005

Gregory M. Rueger, Senior Vice  
President, Generation and  
Chief Nuclear Officer  
Pacific Gas and Electric Company  
Diablo Canyon Power Plant  
P.O. Box 3  
Avila Beach, CA 93424

**SUBJECT: DIABLO CANYON POWER PLANT, UNITS 1 AND 2 - NRC EXAMINATION  
REPORT 05000275/2005301; 05000323/2005301**

Dear Mr. Rueger:

On February 16, 2005, the Nuclear Regulatory Commission (NRC) completed initial operator licensing examinations at your Diablo Canyon Generating Station, Units 1 and 2. The enclosed report documents the examination findings, which were discussed on February 16, 2005, with Mr. Jim Becker and other members of your staff.

The examinations included an evaluation of three applicants for reactor operator licenses and nine applicants for senior operator licenses. The written and operating examinations were developed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9. We determined that all applicants satisfied the requirements of 10 CFR Part 55, and the appropriate licenses have been issued.

No findings of significance were identified.

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

Docket: 50-275; 50-323  
License: DPR-80; DPR-82

Enclosure:  
NRC Examination Report 05000275/2005301  
and 05000323/2005301 w/Supplement Information

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**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Dockets: 50-275, 50-323  
Licenses: DPR-80, DPR-82  
Report: 05000275/2005301; 05000323/2005301  
Licensee: Pacific Gas and Electric Company (PG&E)  
Facility: Diablo Canyon Power Plant, Units 1 and 2  
Location: 7 ½ miles NW of Avila Beach  
Avila Beach, California  
Dates: February 8-16, 2005  
Chief Examiner: Gary Johnston, Senior Operations Engineer  
Examiners: Paul C. Gage, Senior Operations Engineer  
Jim Drake, Operations Engineer  
Approved By: Anthony T. Gody, Chief  
Operations Branch  
Division of Reactor Safety

## SUMMARY OF FINDINGS

ER 05000275/2005301 and 05000323/2005301 on 2/8-16/2005, Diablo Canyon Generating Station, operator licensing examinations.

NRC examiners evaluated the competency of three applicants for reactor operator licenses and nine applicants for senior operator licenses. The licensee developed the examinations using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9. Licensee proctors administered the written examinations to all applicants on February 7, 2005, in accordance with instructions provided by the chief examiner. The NRC examiners administered the operating tests on February 8 through 16, 2005. No findings of significance were identified.

## Report Details

### 4. OTHER ACTIVITIES

#### 4OA4 Initial License Examinations

##### .1 Operator Knowledge and Performance

###### a. Examination Scope

The NRC examination team administered the operating examinations to the 12 applicants on February 8 through 16, 2005. Most of the applicants participated in 2 or 3 dynamic simulator scenarios, a control room and facilities walkthrough test consisting of 10 system tasks, and an administrative test consisting of tasks in 5 areas. The 2 applicants upgrading their reactor operator licenses to senior operator licenses participated in only 1 scenario and took a control room and facilities walkthrough test consisting of only 5 system tasks. Their administrative test consisted of performing tasks in 5 areas.

On February 7, 2005, the licensee proctored the administration of the written examinations to all 12 applicants and forwarded the proposed grades together with the performance analysis to the NRC for approval.

###### b. Findings

Eleven applicants passed all parts of the examinations. One applicant failed the written portion of the examination. For the written examinations, the average score for reactor operator applicants was 86.30 percent, and the average score for senior operator applicants was 84.92 percent. The reactor operator applicant scores ranged from 80.82 to 89.04 percent, and the senior operator applicant scores ranged from 79.59 to 90.81 percent.

The licensee conducted a performance analysis for the written examinations with emphasis on 11 questions missed by half or more of the applicants. After reviewing the licensee's analysis, the examiners concluded that 9 of the 11 questions were valid, 2 questions were invalid and there were 9 apparent training deficiencies, which the licensee addressed in its corrective action program. The licensee concluded that remediation was necessary on those questions which more than 50 percent of the applicants missed. In addition, the licensee determined that the training material for indications of a locked reactor coolant pump rotor needed to be improved. The NRC concurs with this assessment. The text of the licensee's examination questions and the performance analysis may be accessed in the ADAMS system as noted in the attachment.

There were post-examination comments on four examination questions. The NRC deleted two questions based on the licensee's analysis, and did not concur with the licensee's comments on the other two questions. The licensee challenged the answer or validity of Questions 3, 4, 47, and 68. The evaluation of the challenged questions is described below:

**Question 3** of the reactor operator/senior operator examination:

PLANT CONDITIONS:

A RCS [reactor coolant system] cold leg break has occurred on Unit 1.  
RCS pressure is 800 psig and decreasing slowly.  
RCS level is beginning to drop below the top of the steam generator U-tubes.  
Steam generator pressures are approximately 1000 psig and decreasing slowly.

Which of the following describes the heat removal mechanism currently occurring?

- A. Break flow only.
- B. Break flow and reflux cooling.
- C. Break flow and natural circulation.
- D. Break flow and radiative heat transfer.

Proposed Answer:

- A. Break flow only.

**Licensee Challenge:** The licensee proposed making answer "D", "Break flow and radiative heat transfer" vice "A", "Break flow only", since the stem of the question did not specifically state that the heat removal mechanism of the core was the focus of the question.

**NRC Review:** A review of the licensee's challenge revealed that the stem of the question did not specifically state that the heat removal mechanism was for the core, therefore, depending on the interpretation of question, multiple answers (A, C, and D) could be correct, since multiple answers could be correct, the question was deleted from the examination.

**Question 4** of the reactor operator/senior operator examination:

A locked rotor occurs on a running Unit 1 RCP.

Which of the following describes what you would observe from the time the locked rotor occurs until the RCP trips and the RED light goes out and amps fall to zero?

- A. Amp indication pegs high and after a time delay the breaker trips on overcurrent the green and blue lights are lit.

- B. Almost immediately, before amp indication can peg high, the breaker trips on overcurrent - the green and blue lights are lit.
- C. Amp indication pegs high and after a time delay the breaker trips on overcurrent the green light is lit, the blue light remains out.
- D. Almost immediately, before amp indication can peg high, the breaker trips on overcurrent - the green light is lit, the blue light remains out.

Proposed Answer:

- A. Amp indication pegs high and after a time delay the breaker trips on overcurrent - the green and blue lights are lit.

**Licensee Challenge:** The licensee proposed deleting the question because the lecture stated that the rotor locked instantaneously and no value for the amperage indicated on the ammeter was given. The licensee concluded that this could lead the candidate to the wrong conclusion.

**NRC Review:** A review of the licensee challenge was conducted by the examiners. Since the licensee's challenge was predicated on inadequate training and no examination question issue was discussed, the challenge was not accepted.

**Question 47** of the reactor operator/senior operator examination:

With Unit 1 at 100% power, how does the 12 KV Bus D/E protection circuitry interface with the RCPs?

- A. If 2 out of 3 relays on bus "E" sense < 54 Hz (Hertz), a trip signal is sent to RCP (Reactor Coolant Pump) 1-1 and 1-3 breakers.
- B. If 2 out of 3 relays on either bus "D" or "E" sense < 54 Hz, a trip signal is sent to all 4 RCP breakers.
- C. If 1 out of 2 relays on buses "D" and "E" sense < 70% voltage, a trip signal is sent to all 4 RCP breakers.
- D. If 1 out 2 relays on bus "D" sense < 70% voltage, a trip signal is sent to RCP 1-2 and 1-4 breakers.

Proposed Answer:

- A. If 2 out of 3 relays on bus "E" sense < 54 Hz, a trip signal is sent to RCP 1-1 and 1-3 breakers.

**Licensee Challenge:** The licensee proposed deleting the question because the stem does not specify relays are tripped. The student handout Student Training Guide J5,

"12 kV Electrical System," states that if 1 of 2 27 VD(E)R1 [Reactor Coolant Pump Undervoltage Relay] or 27 VD(E)R2 relays drop to 70 percent, an Undervoltage (UV) signal is developed which will result in a reactor trip if both D and E bus sense an UV condition. An UV signal from 27VD(E) T1 [12 kV Bus Undervoltage Relay] and 27VD(E)T2 trips the Circ Water pump and RCP's on that bus. Therefore, A, C, and D are correct.

**NRC Review:** A review of the licensee's challenge revealed that the licensee's argument was valid. The examination question stem as developed resulted in some ambiguity as to which relays were tripped. The licensee's challenge was accepted as submitted.

**Question 68** of the reactor operator/senior operator examination:

Which of the following is the proper method for independently verifying the position of a normally SEALED CLOSED manual valve?

- A. Visually check the position of the valve stem to verify the valve position.
- B. Remove the seal and attempt to move the valve in the open direction without using excessive force, then close and reseal.
- C. Check the sealed component checklist binder to determine if the valve has been opened.
- D. Remove the seal, attempt to move the valve in the closed direction without using excessive force then reseal.

Proposed Answer:

- D. Remove the seal, attempt to move the valve in the closed direction without using excessive force then reseal.

**Licensee Challenge:** The licensee proposed deleting this question based on Procedure OP1.DC20, Revision 13, "Sealed components," Section 4, General Requirements, step 4.1.5, which states, in part, "Component positions shall be independently verified in accordance with OP1.DC2, "Verification of Operating Activities." Using the verification techniques described in that procedure, component seals shall be installed following the independent verification of the valve position. According to Procedure OP1.DC20, the sequence for installing seals is after the independent verification. The licensee argued that if candidates performed independent verification of valve position while on shift, this may be the procedure that they were familiar with and, therefore, no answer would be completely correct.

**NRC Review:** Licensee Procedure OP1.DC2, Revision 13, "Sealed Components," Section 4.5, states, in part, "Sealed or locked valves shall be verified with the sealing or locking devices removed." Therefore, in order to perform verification of a sealed valve, the seal must first be removed. The question and answer are correct as given.

## .2 Initial Licensing Examination Development

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

### .2.1 Operating Examination Outline and Examination Package

#### a. Examination Scope

The facility licensee submitted the operating examination outlines on October 19, 2004. Examiners reviewed the submittal against the requirements of NUREG-1021, Revision 9, and forwarded minor comments to the licensee on October 26, 2004. The facility licensee submitted the draft examination package on December 9, 2005. Examiners reviewed the draft submittals against the requirements of NUREG-1021, Revision 9, and provided comments to the licensee on December 22, 2004. The chief examiner conducted an onsite validation of the examinations and provided further comments during the week of January 10, 2005. The licensee satisfactorily completed comment resolution January 25, 2005.

#### 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 examinations initially submitted by the licensee were within the range of acceptability expected for a proposed examination and were satisfactory.

No findings of significance were identified.

### .2.2 Simulation Facility Performance

#### a. Scope

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

#### b. Findings

No simulator deficiency was noted during validation and no findings of significance were identified.

.2.3 Examination Security

a. Scope

The examiners reviewed examination security both during the onsite preparation and examination administration weeks with respect to NUREG-1021 requirements. Written plans for simulator security and applicant control were reviewed and discussed with licensee personnel.

b. Findings

No findings of significance were identified.

4OA5 Management Meetings

Exit Meeting Summary

The examination team presented the examination results to Mr. Jim Becker, Station Director, and other members of the licensee's management staff at the conclusion of the examinations on February 16, 2005. The licensee acknowledged the findings presented.

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

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee

Jim Becker, Station Director  
Steven David, Operations Manager  
Gary Anderson, Assistant Operations Manager  
Paul Roller, Operations Director  
Joe Haynes, Training Manager  
David Burns Supervisor  
Larry Parker, Supervisor  
Thomas Pate, LO31 Coordinator  
Michael Kennedy, Operations Liaison to Shift Manager  
Dwight Christensen, Engineer  
John Buckley, Operations Instructor  
Jack Blackwell, Operations Instructor  
Ron Fortier, Operations Instructor

### ADAMS DOCUMENTS REFERENCED

Accession No.: ML050890447 - Written examination for reactor and senior operators

Accession No.: ML050890455 - Written examination performance analysis