



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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January 29, 2004

Harold B. Ray, Executive Vice President
San Onofre, Units 2 and 3
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**SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3 - NRC
EXAMINATION REPORT 05000361/2003-301; 05000362/2003-301**

Dear Mr. Ray:

On December 19, 2003, the US Nuclear Regulatory Commission (NRC) completed an examination at your San Onofre Nuclear Generating Station, Units 2 and 3. The enclosed report documents the examination findings, which were discussed on December 19, 2003, with Mr. R. Sandstrom, Nuclear Training Manager, and other members of your staff.

The examination included the evaluation of six applicants for reactor operator licenses and two applicants for instant senior operator licenses. We determined that all applicants satisfied the requirements of 10 CFR Part 55, and the appropriate licenses have been issued.

In accordance with 10 CFR 2.790 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

Dockets: 50-361; 50-362
Licenses: NPF-10; NPF-15

Southern California Edison

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Enclosure:
Examination Report 05000361/2003-301;
05000362/2003-301

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Dockets: 50-361; 50-362
Licenses: NPF-10; NPF-15
Report No.: 05000361/2003-301; 05000362/2003-301
Licensee: Southern California Edison Co.
Facility: San Onofre Nuclear Generating Station, Units 2 and 3
Location: 5000 S. Pacific Coast Hwy.
San Clemente, California
Dates: December 15-19, 2003
Examiners: T. F. Stetka, Chief Examiner, Senior Operations Engineer, Operations Branch
T. O. McKernon, Senior Operations Engineer, Operations Branch
J. F. Drake, Operations Engineer, Operations Branch
Approved By: Anthony T. Gody, Chief
Operations Branch
Division of Reactor Safety

SUMMARY OF FINDINGS

ER 05000361/2003-301; 05000362/2003-301; 12/15-19/2003; San Onofre Nuclear Generating Station, Units 2 and 3; Initial Operator Licensing Examinations

NRC examiners evaluated the competency of six applicants for reactor operator licenses and two applicants for instant senior operator licenses at San Onofre Nuclear Generating Station, Units 2 and 3. The NRC developed the written examination and the licensee developed the operating examination using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 8, Supplement 1. The written examination was administered by an NRC examiner and the facility to the applicants on December 19, 2003. The NRC examiners administered the operating tests on December 15-18, 2003.

Cornerstone: Human Performance

No findings of significance were identified (Section 40A4.1).

REPORT DETAILS

4. OTHER ACTIVITIES (OA)

4OA4 Initial Operator License Examination

.1 Operator Knowledge and Performance

a. Examination Scope

The NRC examination team administered the various portions of the operating examination to all eight applicants on December 15-18, 2003. The six applicants for reactor operator licenses and the two applicants for instant senior operator licenses participated in two dynamic simulator scenarios. The six applicants for reactor operator participated in a control room and facilities walk-through test consisting of 10 system tasks, and an administrative test consisting of 5 administrative tasks. The two applicants for instant senior operator participated in a control room and facilities walk-through test consisting of 10 system tasks, and an administrative test consisting of 5 administrative tasks.

On December 19, 2003, the licensee and the NRC proctored the administration of the written examinations to all eight applicants. The licensee staff graded the written examinations, analyzed the results, and presented their analysis to the NRC on December 23, 2003.

b. Findings

All eight of the applicants passed all parts of the examinations. The applicants demonstrated good 3-way communications, alarm response, and peer checking. For the written examinations, the reactor operator applicant's average score was 83.8 percent and ranged from 80 to 88 percent, the senior operator applicant's average score was 93.5 percent and ranged from 92 to 95 percent. The overall written examination average was 88.7 percent. The text of the examination questions may be accessed in the ADAMS system under the accession numbers noted in the attachment.

1) The licensee conducted a performance analysis for the written examinations, submitting them to the chief examiner on December 23, 2003. As the result of this analysis, the licensee made recommendations regarding three written examination questions. These questions and the NRC resolution follow:

Reactor Operator Question 61

"Given the following conditions:

- * A small break Loss of Coolant Accident has occurred.
- * High Pressure Safety Injection (HPSI) Pump P017 has tripped on over current.
- * The crew aligned and started HPSI Pump P018.
- * Two charging pumps are running.
- * Pressurizer pressure is 1500 psia and steady.

*HPSI Pumps P018 and P019 were secured upon meeting the requirements of FS-7, HPSI Throttle/Stop Criteria.

* PZR level indicates 20% and DROPPING SLOWLY.

Which ONE (1) of the following describes the action required?

A. Start HPSI Pump P018 and throttle open enough HPSI Injection valves to raise Pressurizer level to at least 28%.

B. Start HPSI Pump P018 and P019 and the third Charging Pump and fully open all HPSI Injection valves.

C. Start HPSI Pumps P018 and/or P019 and fully open enough HPSI Injection valves to raise Pressurizer level to at least 28%.

D. Start HPSI Pumps P018 and/or P019 and throttle open HPSI Injection valves.

Answer: D

San Onofre Comment: Accept two correct answers B and D

Justification: Given the initial condition of the pressurizer pressure steady at 1500psia, the required actions of Floating Step 7, FS-7, of SO23-12-11 Emergency Operating Instructions supporting attachments, would require the operator to “Operate Charging and SI systems as necessary to maintain Throttle/Stop criteria satisfied. Throttle Loop Injection valves -as required. Answers B and D essentially state the same thing in that at 1500 psia, the requirement to throttle open as required would cause the operator to fully open the injection valves as level would not increase with pressure greater than the shut off head of the HPSI pumps.”

NRC Determination: The examiners did not concur with the recommendation to accept both B and D as correct answers. Based on a review of the conditions given in the question and the requirements of Procedure SO23-12-11, the examiners determined that the correct answer is B instead of D. Given the plant conditions (1500 psia of pressure), a failure to start the additional charging pump would violate the procedural requirement to operate charging and safety injection systems as necessary to satisfy the safety injection throttle/stop criteria.

The licensee concurred with the NRC’s determination and the examinations were re-graded to reflect this distractor change.

Reactor Operator/Senior Operator Question 73

“Given the following conditions:

- * A Station Blackout has occurred.
- * The diesel generators have both failed to start.
- * SO23-12-1 Standard post trip Actions steps 1 through 10 have been completed
- * Diagnosis of Station Blackout has been verified

- * Actions have been taken to notify the Shift Manager of the situation
- * The Emergency plan has been initiated

In accordance with SO 23-12-8, Station Blackout, which ONE (1) of the following describes the FIRST action taken by the crew?

- A. Initiate SO23-12-11, Attachment 8, Restoration of Offsite Power.
- B. Restore and maintain at least one (1) S/G level between 30% and 80% NR
- C. Bleed steam as necessary to maintain S/G pressure 1100 psia using ADV's
- D. Attempt to energize 1E 4KV bus A04 or A06 from the other unit.

Answer: A

San Onofre Comment: Accept two answers: A & D

Justification: The Station Blackout Emergency Operating Instruction, SO23-12-8, main body step 2.b, has the operator initiate the foldout page. The operator is then working down two parallel paths, with one being to continue the main body steps and the second path is working down the foldout page. In the main body, at step 4.a, attachment 6 is initiated. (Answer D) Down the second path, the foldout page, the operators will, in step 3.a, verify 220kV switchyard is not energized and then direct the initiation of SO23-12-11 Emergency Operating Instructions Supporting Attachments, Attachment 8, Restoration of Offsite Power. (Answer A)

Both answers should be correct as there is no set expectations as to which step would be reached first by the operator and either attachment could be initiated first without impact to plant safety.”

NRC Determination: The examiners concurred with the licensee’s justification for accepting both answers. The examiners noted that there appeared to be a conflict within the procedure which allowed either answer to be correct. The licensee will review the procedure and determine if the apparent conflict could cause incorrect response to a station blackout event. The examinations were re-graded to reflect these distractor changes.

Reactor Operator/Senior Operator Question 82

“Given the following conditions:

- * The plant is in Mode 1, 100% power
- * It has been determined that the Trisodium Phosphate baskets in containment were inadvertently emptied during the last outage.

IF a LOCA were to occur, which ONE (1) of the following describes the consequences of this action?

INCREASED:

- A. containment pressure.
- B. formation of oxygen.
- C. containment iodine levels.
- D. formation of hydrogen.

Answer: C

San Onofre Comment: Accept two answers: C & D

Justification: The San Onofre Design Bases Document for Plant Level Items, DBD-SO23-TR-PL, section for Long term Cooling Post Accident, Page 105 of 209 states, "Long-term chemistry control of the recirculated sump solution is accomplished by trisodium phosphate (TSP) stored in containment. TSP buffers the solution to $7.0 < \text{pH} < 8.0$. This range enhances long-term retention of iodine (Answer C) while sufficiently high to avoid chloride stress corrosion of austenitic stainless steel, yet low enough to avoid excessive generation of hydrogen by the corrosion of non-ferrous Containment metals" (Answer D)."

NRC Determination: The examiners did not concur with the licensee's recommendation that answer D was correct. The failure to place the TSP in the containment would cause the water in the containment to have a pH of less than 7.0. At a pH of 7.0 or less, the excessive generation of hydrogen caused by the corrosion of non-ferrous Containment metals, would not be a consequence.

The licensee concurred with the examiner's determination.

2) Chapter ES-403 and Form ES-403-1 of NUREG 1021, required the licensees to analyze the validity of any written examination questions that were missed by half or more of the applicants. The licensee performed this review and identified the following eight questions that were missed by over half of the applicants.

Reactor Operator/Senior Operator Question 1:

Given the following conditions:

- * Reactor Power 100%
- * Group 6 CEA 23 LEL is lit
- * Core mimic light for CEA 23 is lit
- * Tcold is 535°F and lowering
- * Which ONE (1) of the following actions should be taken in accordance with SO23-13-13, Misaligned Control Element Assembly?

Within 15 minutes of discovery initiate Rx Power reduction of 5% by...

- A. inserting Part Length CEAs.
- B. inserting Group 6 CEAs.
- C. commencing RCS boration.
- D. reducing turbine load using CVOL.

Answer: C.

This question was missed by six of the eight applicants.

The licensee determined that this was a valid question and that answer D chosen by six of the applicants was a valid answer. The licensee concluded that no further action was required. The examiners also reviewed this question and determined that the only correct answer was answer D and not answer C. When this observation was discussed with the licensee, the licensee concurred with the examiners' finding. The examinations were re-graded to reflect this distractor change.

Reactor Operator/Senior Operator Question 13:

This question was missed by all of the applicants.

The licensee determined that this was a valid question. The licensee further determined that their training was lacking in this area and that the training materials needed to be updated. The examiners agreed with the licensee's assessment and planned actions.

Reactor Operator/Senior Operator Question 45:

This question was missed by five of the eight applicants.

The licensee determined that this was a poor question because the question was only testing the applicant's knowledge of the actual labels for the switches on the excore instrumentation drawers instead of their understanding of the function of the switches. While the examiners agreed with the licensee's assessment, the examiners also noted that this question was selected from the licensee's examination bank and was subsequently modified. The modifications did not change the basic question's intent. The licensee concurred with the examiner's comments and will review their bank to determine if similar questions exist.

Reactor Operator/Senior Operator Question 48:

This question was missed by four of the eight applicants.

The licensee determined that this was a valid question, that the training materials contained the correct information, and that no further action was required. The examiners disagreed with the licensee's assessment. Since all of the applicants missed

the question, it appeared that there was a training deficiency. The licensee acknowledged the examiner's comments and agreed that the applicants would be given remedial training on this subject.

Reactor Operator/Senior Operator Question 71:

This question was missed by six of the eight applicants.

The licensee determined that this was a poor question. Although they considered it to be technically correct, the differentiation between the correct and incorrect answer was only a difference of 5% power. In addition, they stated that the component being discussed (moisture separator reheater) was infrequently removed from service, or not removed from service at all, while at power. The licensee concluded that no further action was required.

The examiners did not agree with the licensee's assessment. Even though this evolution was used only infrequently, this was an area included in the applicant's training. Therefore, the examiners considered the training to be lacking in this area and that remedial training was needed. The licensee acknowledged the examiner's comments and will conduct remedial training in this area.

Reactor Operator/Senior Operator Question 72:

This question was missed by six of the eight applicants.

The licensee determined that this question was poorly worded. The correct answer did not contain information on the vacuum pump while two of the answers did list the vacuum pump status. Since the applicants knew that the stated conditions would result in a vacuum pump start, they selected an answer containing this statement. The licensee concluded that the training materials were correct as written and that no further action was required.

The examiners did not agree with the licensee's assessment. The examiners noted that even though the vacuum pumps would start, the placing of the air assisted air ejectors in service during continued condenser vacuum degradation was the design intent of the system and was the intent of the question. The examiners concluded that the training in this area was lacking and that remedial training was needed. The licensee acknowledged the examiner's comments and agreed to conduct remedial training in this area.

Reactor Operator and Senior Operator Question 78:

This question was missed by seven of the eight applicants.

The licensee determined that this question was poorly worded. They noted that the training material and procedures address the use of the Respiratory/Service Air System

(RSAS) as a backup for the instrument air system. The question was asking which one of the four answers was not a purpose/function of the RSAS that would be needed to assure the safe shutdown of the plant. They further stated that the correct answer was confusing in that the RSAS was designed to allow continued operation of the plant.

The examiners did not agree with the licensee's assessment. Since the RASA was designed to allow continued operation of the plant, it was not needed for the shutdown of the plant. Therefore the only correct answer was the one that addressed the plant shutdown. The examiners concluded that the training in this area was lacking and that remedial training was needed. The licensee acknowledged the examiner's comments and agreed to conduct remedial training in this area.

The licensee is taking action to correct these issues. Action request 040100403 was opened to track the required remedial training, to update the lesson material, and to track the bank question review.

No findings of significance were identified.

.2 Initial Licensing Examination Development

The licensee developed the operating portion of the examination and the NRC developed the written portion of the examination in accordance with NUREG-1021, Revision 8, Supplement 1. All licensee facility training and operations staff involved in examination preparation and validation were on a security agreement.

.2.1 Examination Outline and Examination Package

a. Examination Scope

The facility licensee submitted the operating examination outlines on August 5, 2003. The chief examiner reviewed the submittal against the requirements of NUREG-1021, Revision 8, Supplement 1, and provided comments to the licensee. The facility licensee submitted the final draft operating examination package on October 22, 2003. The chief examiner reviewed the draft submittal against the requirements of NUREG-1021, Revision 8, Supplement 1, and provided comments to the licensee on the examination on November 13, 2003. The NRC conducted an onsite validation of the operating examinations and provided further comments during the week of November 17, 2003. The licensee satisfactorily completed comment resolution on November 25, 2003.

b. Findings

The NRC approved the initial examination outline and advised the licensee to proceed with the operating examination development.

The examiners determined that the operating examination initially submitted by the licensee was within the range of acceptability expected for a proposed examination.

No findings of significance were identified.

.2 Simulation Facility Performance

a. Examination Scope

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

b. Findings

No findings of significance were identified.

.3 Examination Security

a. Examination Scope

The examiners reviewed examination security both during 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

No findings of significance were identified.

4OA5 Management Meeting

.1 Exit Meetings

The chief examiner presented the examination results to Messrs. R.L. Sandstrom, Nuclear Training Manager, Ray Waldo, Station Manager, and other members of the licensee's management staff on December 19, 2003. The licensee acknowledged the findings presented.

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

ATTACHMENT

KEY POINTS OF CONTACT

Licensee

K. Rauch, Operations Training Manager
J. Arsenault, Training Contractor
M. Kline, Training Instructor
N. Scheuerlein, Training Instructor
R. Giroux, Training Instructor
J. Marron, Training Instructor

ADAMS DOCUMENTS REFERENCED

Accession No: ML040210270 - Written examination for reactor operators
Accession No: ML040210285 - Written examination for senior operators