

U. S. NUCLEAR REGULATORY COMMISSION  
REGION I

PEACH BOTTOM ATOMIC POWER STATION REQUALIFICATION EXAMINATION

Report Nos. 50-277/92-02 (OL)  
50-278/92-02 (OL)

Facility Docket Nos. 50-277  
50-278

Facility License Nos. DPR-44  
DPR-56

Licensee: Philadelphia Electric Company  
P. O. Box 195  
Wayne, Pennsylvania 19087-0195

Facility Name: Peach Bottom Atomic Power Station Units 2 and 3

Examination Dates: February 26, 1992  
March 9-12, 1992  
March 27, 1992

Examiners: D. Draper, Contractor, PNL  
M. Morgan, Contractor, PNL  
J. Stewart, Operations Engineer

Chief Examiner: J. H. Williams 4/3/92  
H. Williams, Sr. Operations Engineer Date  
BWR Section, Operations Branch, DRS

Reviewed by: Richard J. Conte for 4/3/92  
Richard J. Conte, Chief Date  
BWR Section, Operations Branch  
Division of Reactor Safety

### Peach Bottom 1992 Requalification Examination Summary

Written and operating examinations were administered to two reactor operators (ROs) and five senior reactor operators (SROs). These operators were divided into two crews: one operating and one staff crew. The examinations were graded concurrently by the NRC and the facility training staff. As graded by the NRC, both crews performed satisfactorily on the simulator portion of the exam and six operators passed all portions of the examination. One staff SRO failed the walk-through part of the exam. The facility also failed the staff SRO on the walk-through and one reactor operator on the dynamic simulator portion of the examination due to a more conservative grading criteria. The reactor operator was removed from licensed duties, given remedial training, and retested before resumption of licensed duties. The NRC reexamined the staff SRO on March 27. He passed his examination.

One individual was reexamined on the simulator portion of an initial SRO Instant examination during the requalification examination preparation week. He passed his reexamination.

Communication and teamwork among the crews were weak during the six dynamic simulator examinations. Operators were not following the guidance on verbal communications in Section 4 of the Operations Manual.

During transients, the STA was, at times, busy collecting data, assisting operators and performing procedures and had no time to make assessments of the plant behavior. Furthermore, the STA, as well as nonlicensed operators, manipulated reactivity controls in the simulator facility during transients. These actions are not allowed in the nuclear power plant by 10 CFR 50.54(i), and it is so stated in section 3 of the Operations Manual. Operations Section Performance Standard (OSPS-13) allows the STA to manipulate controls during transients. After discussing these inconsistencies, the facility agreed to resolve them.

The material submitted for use in developing the examination did not always meet the guidelines of the Examiner Standards. For example, the written examination had a number of questions in a format not conforming to NUREG/BR-0122 guidance, the written examination may have been too short and not well time validated, and the dynamic scenarios had some misidentified critical tasks. Section 3 has the details.

## DETAILS

### 1.0 Introduction

The NRC administered requalification examinations to seven licensed operators (2 ROs, and 5 SROs). These operators made up two crews; one operating and one staff crew. The examiners used the process and criteria described in NUREG-1021, "Operator Licensing Examiner Standard," Revision 6. Since 12 operators were not examined, a program evaluation could not be made. The NRC will combine the results of this examination with further examinations to evaluate this program.

The contents of the examination as administered are summarized in Attachment 1. An exit meeting was held at the facility on March 13, 1992. Those in attendance are listed in Attachment 2. Exam results and findings were discussed.

Two scenarios were prepared and run for a reexamination of an initial SRO Instant candidate. This exam was given on February 26, 1992.

William F. Kane, Deputy Regional Administrator, observed the simulator examinations on Monday, March 9, 1992. David Prawdzik, an examiner from INEL, observed the examinations on March 9, 10, and 11, 1992.

### 2.0 Summary of Examination Results

#### 2.1 Individual Examination Results

The following is a summary of the NRC and facility results:

NRC Grading

| NRC Grading  | RO Pass/Fail | SRO Pass/Fail | TOTAL Pass/Fail |
|--------------|--------------|---------------|-----------------|
| Written      | 2/0          | 5/0           | 7/0             |
| Simulator    | 2/0          | 5/0           | 7/0             |
| Walk-through | 2/0          | 4/1*          | 6/1*            |
| Overall      | 2/0          | 4/1*          | 6/1*            |
|              |              |               |                 |

## Facility Grading

| FACILITY Grading | RO Pass/Fail | SRO Pass/Fail | TOTAL Pass/Fail |
|------------------|--------------|---------------|-----------------|
| Written          | 2/0          | 5/0           | 7/0             |
| Simulator        | 2/1          | 5/0           | 6/1             |
| Walk-through     | 2/0          | 4/1*          | 6/1*            |
| Overall          | 2/1          | 4/1*          | 5/2*            |
|                  |              |               |                 |

\*The individual was given remedial training and reexamined on March 27, 1992. He passed the second examination.

One SRO Instant candidate was reexamined on the simulator portion of an initial examination which he took back in August 1991. He passed his reexamination.

## 2.2 Facility Generic Strengths and Weaknesses Based on Individual Performance

A summary of strengths and weaknesses noted by the NRC as a result of preparation and administration of the examinations is discussed below. This information is being provided to aid the licensee in improving the requalification program.

### 2.2.1 Strengths

- Operators demonstrated proficiency with control board operations.
- Operators readily recognized entry conditions into Off Normal, Operating Transient, and Transient Response Implementing Procedures.
- Emergency classifications were prompt and correct.

### 2.2.2 Weaknesses

- Crew team work was weak. The crews did not function as a team in decision making.

- Communications was weak and did not follow the guidance of the Operations Manual.
- In many cases, the Shift Manager was so busy with emergency classifications and filling out notification forms that he could not maintain an overview of the plant or provide help to the Shift Supervisor.

### 2.3 Role of STA

The STA was an active crew member during the dynamic simulator examination. At times, he was too busy with data collection and procedure implementation to carry out an independent assessment of the plant. During one scenario, the STA requested that a licensed operator monitor the sumps at the same time the shift supervisor was directing the same operator to drive control rods into the core.

During transients that require T-213, "Scram Solenoid Deenergization," to be performed, the STA routinely operated the individual test switches for the control rods. Section 3 of the Operations Manual (OM) page 2 of 23 states only licensed operators or senior licensed operators can operate these switches. During a transient, the floor operator (a nonlicensed operator) routinely performed a T-214, "Isolating and Venting Scram Air Header," which involves venting the Scram Air Header. This activity will directly affect reactivity or power level and should only be done by a licensed individual as stated in the OM. OSPS-13 states that during transients, it is the responsibility of the STA to operate individual CRD scram test switches provided he is directed by the SRO/RO. These inconsistencies were discussed with the licensee and will be resolved by the facility.

### 2.4 Decay Heat Model used in the Simulator

During the simulator examinations, the examiners expressed skepticism regarding the size of the decay heat source (DHS). It appeared that the DHS was not large enough to model actual plant behavior. The DHS was described for middle-of-cycle conditions.

Peach Bottom uses ANS 5.1-1973 (draft) for the DHS. At times less than two minutes, this DHS is slightly larger than the ANS 5.1-1979 model. For times greater than two minutes, the two versions of ANS 5.1 agree with each other. For fuel irradiations of over one month, the DHS is about the same magnitude during the first hour after shut down. Peach Bottom simulator plots of decay

heat for beginning, middle, and end of cycle conditions were compared, and it was verified that the decay heat was the same for each case. An event report (PB 89-02) of an MSIV closure and scram from 79% power was reviewed and compared with a simulation of the event. The simulator tracked reactor pressure well when compared to actual plant data.

Based upon this information, it is concluded that the Decay Heat Source model is acceptable.

### 3.0 Examination Materials

The following observations were made when the examination materials were compared with the guidance of the Examiner Standards.

#### 3.1 Scenarios

ES-604 describes critical tasks as tasks which, if omitted or performed incorrectly, result in adverse consequence(s) which significantly alter the mitigation strategy to the detriment of plant or public safety. The facility misidentified tasks which did not meet this intent.

A new scenario (SEG-714R) from the facility bank was added to the exam during prep week to allow use of more EOP's (Level/Power Control).

The Examiner Standards sets a target of 50 minutes for average scenario length. The estimated run time by the facility was 50 minutes. The actual run time for the six scenarios varied from 45 to 73 minutes with an average time of 58 minutes. This compares very well with the Examiner Standards.

#### 3.2 Walk-through

The facility used recent NRC guidance on faulted JPM's and developed JPM's to meet this guidance. During the review process, a few critical steps were identified as not meeting Examiner Standards guidance.

The facility scheduled and planned their JPM's so that they were performed without delays. This reduced operator stress associated with waiting for the test to be conducted. The walk-through portion of the examination was well planned and conducted in an effective manner.

### 3.3 Written Examination

A question format concern was identified during the exam review. The stem of the question was followed by four premises with the correct answer being selected by choosing the correct combination of the premises. One concern with this format was, when one of the four premises was eliminated, two answers could easily be eliminated. This reduced the question to the equivalent of a true/false question. There were 19 out of 36 questions with this format. Some of these questions were revised. After prep week, the examiner requested guidance from OLB on the acceptability of the format. OLB had previously determined that the format had the same attributes as a negatively worded stem which, according to the Examiner Handbook (NUREG/BR-0122), should be avoided whenever possible. This information was given to the licensee. An analysis of the written exam results indicated that questions of the undesirable format were missed as often as the other questions. This indicated that the examination was valid.

The time validation of the questions on the examination seemed arbitrary and was questioned by the NRC during prep week. Each question, in both parts A and B, was estimated to take five minutes. The exam time validation issue was pursued during the administration phase by observation of the time required to take the examination. The following table (in minutes) shows an NRC estimate, the facility validated time and the actual times.

| Exam Section | Standard | NRC Estimate | Facility Validated | Actual Times |        |
|--------------|----------|--------------|--------------------|--------------|--------|
|              |          |              | Time               | Average      | Range  |
| A1-SRO       | 45 + 15  | 18-27        | 40                 | 49           | 40-60  |
| -RO          |          | --           |                    | 46           | 28-59  |
| A2-SRO       | 45 + 15  | 27-31        | 47                 | 44           | 38-58  |
| -RO          |          | --           |                    | 35           | 26-44  |
| B-SRO        | 90 + 30  | 40-61        | 87                 | 104          | 90-119 |
| -RO          |          | --           |                    | 113          | 99-118 |

During the examinations the following observations were made.

- Operators did not answer questions in order and often came back to ones causing difficulty.
- Some small delays were observed in operators waiting for references that another operator was using.

- Operators did not answer all questions and then check or verify answers. At times they would verify answers as they proceeded through the exam. If the operator was sure of his answer, he did not check it.
- It was not possible to know, if a reference was used for an answer or to verify an answer to a question.
- More than one reference could be used for one question.
- The number of references used by operators on part B varied from 8 to 23.
- The time spent using a reference varied from about one minute to over five minutes.

The facility indicated that they believed the time allotted for exam completion was challenging. They cited the validation times by an SRO to support their viewpoint. They also indicated that using one SRO/RO to take the exam was their normal method of time validating exams.

Some questions within the proposed static examinations did not require the simulator to answer. Therefore, this type of question was moved from the front of the exam to be back of the exam. This was done to eliminate confusion by the operator who had just walked down the simulator and was ready to use the machine as a source of answers.

## 5.0 Exit Meeting

An exit meeting was conducted on March 13, 1992. Personnel attending the meeting are listed in Attachment 2. The NRC presented results of the examination and discussed examination related findings.

### Attachments:

1. Requalification Examination Test Items
2. Persons Contacted
3. Simulation Facility Report



Attachment 1Requalification Examination Test ItemsDynamic Simulator Scenarios

SEG-701R SEG-714R SEG-720R SEG-703R SEG-711R

JPM ExamJPM Questions

|       |                                |            |
|-------|--------------------------------|------------|
| 001C  | Start D/G                      | 2429, 2430 |
| 017C  | Synchronize T/G                | 2291, 2292 |
| 301CF | SLC injection (Faulted)        | 2454, 2455 |
| 300CF | HPCI Initiation (Faulted)      | 2466, 2467 |
| 053C  | Containment Venting            | 2334, 2335 |
| 008C  | Reset Scoop Tube Lockup        | 2284, 2286 |
| 049P  | D/G air start                  | 2367, 2368 |
| 086P  | Defect RCIC Isolation          | 2071, 2072 |
| 074P  | Scram Air Header               | 2400, 2603 |
| 056P  | Reset RCIC Trip                | 2380, 2381 |
| 031C  | Exciting Main Generator        | 3671, 2309 |
| 002C  | Load D/G                       | 2281, 2569 |
| 007C  | Reset Recirc Runback           | 2452, 2453 |
| 303CF | RFP Turbine Shutdown (Faulted) | 2320, 2321 |
| 302CF | RCIC Initiation (Faulted)      | 2297, 3672 |
| 103P  | Alt. Injection with RWTS       | 3252, 3253 |
| 101P  | Driving Rods - ATWS            | 3235, 3236 |

Written Exam Part A

|          | RO (92-RAI-N) | SRO (92-SAI-N) |
|----------|---------------|----------------|
| SEG 511R | 172           | 174            |
|          | 177           | 177            |
|          | 1010          | 1010           |
|          | 175           | 175            |
|          | 173           | 1007           |
|          | 1007          | 1008           |
|          | 1008          | 174            |
|          | 1009          | 3667           |
|          | 174           | 370            |

|                     | RO (92-RA2-N)  | SRO (92-SA2-N) |
|---------------------|----------------|----------------|
| SEG 0523R           | 411            | 411            |
|                     | 413            | 412            |
|                     | 412            | 417            |
|                     | 417            | 418            |
|                     | 418            | 1012           |
|                     | 1012           | 1014           |
|                     | 1014           | 1013           |
|                     | 1015           | 416            |
|                     | 391            | 391            |
| Written Exam Part B | SRO (92-SB-NO) | RO (92-RB-NO)  |
|                     | 203            | 2941           |
|                     | 2947           | 469            |
|                     | 50             | 160            |
|                     | 2901           | 2901           |
|                     | 564            | 324            |
|                     | 2567           | 331            |
|                     | 329            | 2044           |
|                     | 1622           | 1716           |
|                     | 350            | 350            |
|                     | 469            | 328            |
|                     | 2044           | 2567           |
|                     | 1716           | 1622           |
|                     | 371            | 551            |
|                     | 3114           | 373            |
|                     | 162            | 203            |
|                     | 367            | 3114           |
|                     | 467            | 554            |
|                     | 1609           | 367            |

Attachment 2

Persons Contacted

Philadelphia Electric Company

Donald B. Miller, Vice President, PBAPS (1)  
Ken Powers, Plant Manager (1)  
John J. Stankiewicz, Training Superintendent (1)  
Tom Niessen, Operations Superintendent (1)  
George Gellrich, Assistant Operations Superintendent (1)  
Dennis W. McClellan, Operations Training Supervisor (1)  
Chris Schwarz, Shift Manager (1, 2)  
Kevin Patek, Senior Instructor (1, 2)  
Mitchell Rosenberg, Supervisor, Simulator Support (1)  
Richard Tyler, Simulator Test Operator (1)  
Ron Smith, Regulatory Engineer (1)

Nuclear Regulatory Commission

Rich Conte, Chief, B'VR Section (1)  
Michele Evans, Resident Inspector (1)  
Herb Williams, Senior Operations Engineer (1, 2)

Notes

- (1) Attended exit meeting
- (2) Exam development team

Attachment 3

SIMULATION FACILITY REPORT

Facility Licensee: Philadelphia Electric Company, Peach Bottom Atomic Power Station

Facility Docket Nos.: 50-277 and 50-278

Requalification Examination Administered on: March 9-10, 1992

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and are not, without further verification and review, indicative of noncompliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information which may be used in future evaluations. No licensee action is required in response to these observations.

During the conduct of the simulator portion of the operating tests, the following items were observed (if none, so state):

NONE