

PEACH BOTTOM ATOMIC POWER STATION  
UNITS 2 AND 3

ADDENDUM A TO TECHNICAL EVALUATION REPORT  
FIRST-INTERVAL INSERVICE INSPECTION PROGRAM

Submitted to

U.S. Nuclear Regulatory Commission  
Contract No. NRC-03-83-096

Submitted by

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May 1, 1985

8506040509XA

## CONTENTS

INTRODUCTION . . . . .	1
Relief Request, Internal Surfaces of Pumps, Category B-L-2, Item B5.7 . . . . .	2
Relief Request, Internal Surfaces of Valves, Category B-M-2, Item B6.7 . . . . .	5
Relief Request, Pressure Test Hold Time . . . . .	8
Relief Request, Class 2 Emergency Core Cooling System (ECCS) Components and Piping Previously Exempt Under IWC-1220(c) . . . . .	10
REFERENCES . . . . .	12

ADDENDUM TO TECHNICAL EVALUATION REPORT  
INSERVICE INSPECTION PROGRAM

Peach Bottom, Units 2 and 3

INTRODUCTION

Science Applications International Corporation (SAIC) submitted a Technical Evaluation Report (TER) on the Inservice Inspection (ISI) program for Units 2 and 3 of Peach Bottom for the first inspection interval to the U.S. Nuclear Regulatory Commission (NRC) on August 27, 1982.<sup>1</sup> On May 2, 1983, the NRC issued its formal Safety Evaluation Report,<sup>2</sup> which included SAIC's TER as an appendix. For Peach Bottom Unit 2, the ISI program and relief requests evaluated in these reports covered the last 80 months of the first inspection interval, from November 5, 1977, to July 5, 1984. For Unit 3, they covered the last 80 months of the interval from April 23, 1978, to December 12, 1984. On December 27, 1983, Philadelphia Electric Company submitted a new request for relief for the first interval,<sup>3</sup> which the NRC granted on June 1, 1984.<sup>4</sup>

The ISI program for the second interval, including relief requests, was submitted June 28, 1984.<sup>5</sup> On October 29, 1984, the NRC requested additional information to complete its review of the relief requests.<sup>6</sup> The information was furnished in letters dated December 21, 1984,<sup>7</sup> January 31, 1985,<sup>8</sup> and February 1, 1985.<sup>9</sup> In the December 21, 1984, letter, pursuant to the terms of 10 CFR 50.55a (g)(5)(iv), Philadelphia Electric Company submitted three requests not previously submitted for relief from the 1974 Edition of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (the Code) with Addenda through the Summer of 1975, which was applicable to the first inspection interval. The letter of February 1, 1985, submitted a fourth relief request for the first interval.<sup>9</sup> These four new relief requests are evaluated in this addendum to the originally issued Technical Evaluation Report. All but one relief request pertain only to Unit 3. Relief requests for the second interval are being evaluated in a separate TER.<sup>10</sup>

Relief Request, Internal Surfaces of Pumps, Category B-L-2, Item B5.7  
(Unit 3 Only)

Code Requirement

A visual examination of pump internal pressure boundary surfaces shall be performed on one pump in each of the group of pumps performing similar functions in the system during each inspection interval. The examinations may be performed at or near the end of the inspection interval.

Code Relief Request

Relief is requested from the visual examination of the internal surfaces of the reactor recirculation pump at the pressure boundary.

Proposed Alternative Examination

As an alternative inspection, a UT wall thickness surveillance program to verify structural integrity shall be incorporated into the upgraded ISI program to be performed at or near the beginning of the next 120-month interval.

The following testing shall continue to be implemented on the recirculation pumps to assure structural integrity:

1. Hydrostatic pressure tests and leak tests performed periodically.
2. External visual inspections performed during seal maintenance.
3. Continuous vibration monitoring.
4. Continuous drywell leakage monitoring.
5. Visual inspection of internal surfaces upon pump disassembly for maintenance.

Licensee's Basis for Requesting Relief

The disassembly of a recirculation pump during the current 120-month interval for the sole purpose of visually inspecting its internal surfaces would result in unnecessary personnel exposure, potential hazards, generation of excessively high amounts of radioactive waste and would be in conflict with the concept, "as low as reasonably achievable." There has been no maintenance required on these pumps during the first ten-year interval which would have accommodated visual inspection. As a result of an extensive outage currently in progress on Peach Bottom Unit 2 for replacement of primary system piping, identical pumps were disassembled and

inspected. During this inspection, no reportable indications were discovered. Thus, it is appropriate to postpone inspection of the Unit 3 pumps until the second 120-month ISI interval.

### Evaluation

In its Safety Evaluation Report, (2) the NRC made relief on reactor coolant pumps contingent on maintenance being performed during the first 10-year interval. The licensee has disassembled and examined Unit 2 pumps but not Unit 3 pumps. Thus, the licensee is asking for relief at this time for Unit 3 pumps.

The visual examination is to determine whether unanticipated severe degradation of the casing is occurring due to phenomena such as erosion, corrosion, or cracking. However, examinations of Unit 2 pumps and pumps at other plants have not shown any significant degradation of casings.

The disassembly of the reactor recirculation pumps to the degree necessary to inspect the internal pressure-retaining surfaces is a major effort, involving large personnel exposures and the generation of large amounts of radioactive waste. In view of the effort required to disassemble a pump, the information returned from visual examination of its internal surfaces would be marginal.

The licensee has committed to an ultrasonic surveillance program and visual examination if a pump is disassembled for maintenance. Meanwhile, pressure and flow are monitored during pump performance tests to assess performance.

The proposed ultrasonic surveillance program has not been required of other licensees and, therefore, should be an option rather than a condition of relief. The proposed alternative examination, performance tests, and normal visual examination during system pressure tests are reasonable substitutes for the Code-required examination.

### Conclusions and Recommendations

Based upon the above evaluation, it is concluded that for the pumps discussed above, the Code requirements are impractical. It is further concluded that the alternative examinations discussed will provide necessary added assurance of structural reliability. Therefore, the following are recommended:

- (1) Relief should be granted from the Code-required visual examinations for the first inspection interval.

- (2) The licensee should perform the Code examinations upon any re-circulation pumps disassembled for maintenance or any other purpose during the second interval as proposed.
- (3) The proposed ultrasonic surveillance of the pump casings should be at the licensee's option.

Reference

Reference 7.

Relief Request, Internal Surfaces of Valves, Category B-M-2, Item B6.7  
(Unit 3 Only)

Code Requirement

Visual inspection of the internal pressure boundary surfaces, on valves exceeding 4-in. nominal pipe size shall be performed.

One valve in each group of valves of the same constructional design, e.g., globe, gate, or check valve, manufacturing method and manufacturer that performs similar functions in the system shall be examined during each inspection interval.

The examinations may be performed at or near the end of the inspection interval.

Code Relief Request

Relief is requested from the visual examination of the internal surfaces at the pressure boundary of the Class 1 valves exceeding 4-in. diameter nominal pipe size.

Proposed Alternative Examination

As an alternative inspection, a UT wall thickness surveillance program to verify structural integrity shall be incorporated into the upgraded ISI program.

The following testing shall continue to be implemented on the subject valves to assure structural integrity:

1. Hydrostatic pressure testing and leak tests performed periodically.
2. Continuous drywell leakage monitoring.
3. Visual inspection of internal surfaces upon valve disassembly for maintenance.

Licensee's Basis for Requesting Relief

In order to carry out these inspections, it would be necessary to disassemble these valves during the remainder of the current 120-month interval. Thus, it would be impractical due to time limitation, potential safety hazards, and excessive radiation and contamination exposures. Also,



a large scope of preliminary work which must be performed (i.e., off-loading fuel elements, draining the reactor vessel, plugging the jet pump risers). Consequently, it would be more appropriate to coordinate these inspections with other activities that would require a similar configuration of the NSSS to minimize decontamination and radiation exposures.

We request that relief be granted under the first interval ISI program and commit to the inspection of the subject valves upon valve disassembly for maintenance during the next 120-month interval. There has been no maintenance required on these valves during the first ten-year interval which would have permitted visual inspection to be performed. As with the request for relief from examination of the reactor recirculation pump internals, access to identical valves became available and the visual inspection was performed on the Unit 2 valves. During that inspection no flaws requiring repair were discovered. Thus, there exists a high degree of confidence that inspection of the Unit 3 valves can be appropriately postponed until the second 120-month ISI interval.

#### Evaluation

In its Safety Evaluation Report, (2) the NRC made relief for valves contingent on maintenance being performed during the first 10-year interval. The licensee has disassembled and examined Unit 2 valves but not Unit 3 valves. Thus, the licensee is seeking relief at this time for Unit 3 valves.

The disassembly of large valves to the degree necessary to inspect the internal pressure-retaining surfaces (bodies) is a major effort in terms of exposure of personnel. The licensee has also inspected the Unit 2 valves during this interval and found no flaws. To disassemble Unit 3 valves solely to perform a visual examination of the internal body during this interval is impractical.

The licensee has committed to an ultrasonic surveillance program and visual examination of any valve disassembled for other reasons. The proposed ultrasonic surveillance program has not been required of other licensees and, therefore, should be an option rather than a condition of relief. The proposed alternative visual examinations and normal visual examination during system pressure tests are reasonable substitutes for the Code-required examinations.

#### Conclusions and Recommendations

Based upon the above evaluation, it is concluded that for the valves discussed above, the Code requirements are impractical. It is further concluded that the alternative visual examinations discussed will provide necessary added assurance of structural reliability. Therefore, the following are recommended:



- (1) Relief should be granted from performing the Code-required examinations on valves during the first interval.
- (2) The licensee should perform the Code examination on Unit 3 valves disassembled for maintenance or any other purpose during the second interval as proposed.
- (3) The proposed ultrasonic surveillance of valve bodies should be at the licensee's option.

Reference

Reference 7.

## Relief Request, Pressure Test Hold Time

### Code Requirement

IWA-5210(a) of the 1974 Edition, Summer 1975 Addenda, states that the test pressure and temperature shall be maintained for at least four hours prior to the performance of the examinations.

### Code Relief Request

Relief is requested from pressure-testing hold time requirements of the Code.

### Proposed Alternative Examination

The HPCI and RCIC system hydrostatic pressure test will be performed at a discharge pressure of 1,403 psig with a hold time of ten minutes in accordance with IWC-5000 with inspection per IWA-5000 as specified in Section XI of the 1980 Edition of the ASME Code.

The insulated portion of these systems will be hydrostatically tested using a hydrostatic test pump maintaining the test pressure at 1,403 psig for four hours in accordance with IWC-5000 with inspection per IWA-5000 as specified in Section XI of the 1980 Edition of the ASME Code.

### Licensee's Basis for Requesting Relief

To perform the system hydrostatic pressure test to the 1974 Code requirements, it would be necessary to run the HPCI turbine-driven booster pump/main pump combination or RCIC turbine-driven pump for a minimum of four hours before performing the required inspection in accordance with IWA-5000. During the four-hour run time, the system hydrostatic test pressure would be held at 100% of the nominal system operating pressure of 1,200 psig.

Except for approximately 20 feet of pipe in each system in the outboard main steam isolation valve (MSIV) room, the HPCI and RCIC pump discharge piping is uninsulated. The 1974 Edition of the Code did not recognize that a four-hour hold time for hydrostatic testing of uninsulated pipe is not required. However, the 1980 Edition of Section XI of the ASME Code recognizes that a four-hour hold time for uninsulated pipe is not required and that a hold time of ten minutes is sufficient for uninsulated piping systems. However, the 1980 Edition of the Code requires the system hydrostatic pressure test to be 1.10 times the system design pressure for the HPCI and RCIC systems.

These systems are designed to inject water into the vessel at a pressure equivalent to the highest pressure achieved in the reactor vessel during an operational transient which requires HPCI or RCIC system operation. This pressure is 1,275 psig which can result from an MSIV closure with a high flux scram. Therefore, the system hydrostatic test pressure required, in accordance with IWC-5222(a) of the 1980 Edition of the Code, would be 1,403 psig.

Complying with the 1974 version of this Code would necessitate significantly longer test runs resulting in unnecessary wear and tear on the HPCI and RCIC pumps and on the Residual Heat Removal system pumps which must operate in the torus water cooling mode for at least the same period of time. The requested relief would therefore obviate the need for more than 16 hours of aggregate ECCS equipment operation per unit.

#### Evaluation

The 1980 Edition of Section XI has been referenced in 10 CFR 50.55a and inservice examinations may meet the requirements of this edition in lieu of those from previous editions with the following provisions:

- (a) Commission approval is required to update to the more recent edition (pursuant to 10 CFR 50.55a(g)(4)(iv);
- (b) Any requirement of the more recent edition which is related to the one(s) under consideration must also be met.

The IWA-5213 found in the 1980 Edition has been included in the Code since the Winter 1977 Addenda. Thus, the Code has recognized for many years that a four-hour hold time for uninsulated pipe is not required and that a hold time of ten minutes is sufficient. It is appropriate for the licensee to update to the newer Code version. IWA-5213 refers to types of tests and to pressure and temperature conditions that are defined in other paragraphs of Subsubarticle IWA-5210. The entire subsubarticle needs to be adopted to comply with requirements of (b) above.

#### Conclusions and Recommendations

Pursuant to 10 CFR 50.55a(g)(4)(iv), approval should be granted to update from the requirements of Paragraph IWA-5210 of the 1974 Edition, Summer 1975 Addenda to the requirements of Subsubarticle IWA-5210 in the 1980 Edition. This approval would permit the licensee to carry out its proposed alternative examination.

#### Reference

Reference 9.

Relief Request, Class 2 Emergency Core Cooling System (ECCS) Components  
and Piping Previously Exempt Under IWC-1220(c) (Unit 3 Only)

Code Requirements

The following components may be exempted from the examination requirements of IWC-2520:

- (c) components that perform an emergency core cooling function, provided the control of the chemistry (to minimize corrosive effects) of the contained fluid is verified by periodic sampling and test.

Code Relief Request

Schedule relief under the first ten-year ISI program for inspection of ECCS components and piping in accordance with IWC-1220(c).

Proposed Alternative Examination

We are proposing a schedule to complete inspections on Class 2 ECCS components and piping previously exempted under Article IWC-1220(c) of Section XI of the ASME Code. Since five refueling outages have been completed during the current 120-month ISI interval for Unit 3, Philadelphia Electric Company proposes to examine a minimum one-sixth of the total number of subject components and pipe welds required for examination during the current interval during the next refueling outage. This is based on six inspection periods per 120-month interval. This plan would carry through into the next 120-month ISI interval to ensure that all ECCS component inspections are completed during that interval.

A similar relief request for Peach Bottom Unit 2 was forwarded to the NRC, S. L. Daltroff, PECO, letter to J. F. Stolz, USNRC, December 27, 1983, and found to be acceptable in the NRC response from G. W. Rivenback, USNRC, to E. G. Bauer, Jr., PECO, letter dated June 1, 1984.

Licensee's Basis for Requesting Relief

There is not sufficient time remaining in the current ISI interval to complete the inspection of the subject components and piping, particularly portions of the RHR, Core Spray, and HPCI systems. The following work must be performed prior to the actual required examinations.

1. An examination plan must be developed which includes the physical identification of all pipe welds and components.

2. Erection of a significant amount of scaffolding.
3. Upon gaining access to the piping, the weld crowns require significant rework, since the weld configurations are not conducive to Ultrasonic Testing.

By letter dated May 2, 1983, J. F. Stolz, USNRC, to E. G. Bauer, Jr., PECO, transmitting the Safety Evaluation Report for the first ten-year program, the NRC staff concluded that these examinations should be included and denied the relief request for the current interval.<sup>(2)</sup> At the time of receipt of this letter, Peach Bottom Unit 3 was undergoing inspections of primary system piping in accordance with IE Bulletin 83-02 and there was not sufficient time to develop the inspection plan for ECCS components necessary to satisfy Code requirements.

#### Evaluation

By letter dated June 1, 1984, the NRC approved a similar schedule request for Unit 2. As expressed in that letter, however, the NRC clearly expects that a sample examination of ECCS components be undertaken during the remaining outage. The licensee's proposed examination of a minimum of one-sixth of the required welds during the final refueling outage for Unit 3 (which is the same proposal accepted for Unit 2) meets these expectations. Because of the amount of work required before the examinations could be performed, it would be difficult to perform all required examinations before the end of the interval. Thus, the carryover of these examinations into the second interval would be acceptable.

#### Conclusions and Recommendations

Based on the above evaluation, it is concluded that for the ECCS components and piping discussed above, the schedule requirements associated with the Code requirements are impractical. It is further concluded that the examination discussed above will provide the necessary assurance of structural reliability. Therefore, the following is recommended:

- (1) Relief should be granted from the schedule requirements associated with the required examination of ECCS components and piping previously considered by the licensee exempt under IWC-1220(c) provided that the licensee performs at least one-sixth of the Code-required examinations during the final refueling outage of the first interval for Unit 3.

#### Reference

Reference 7.

## REFERENCES

1. SAIC, Technical Evaluation Report, Peach Bottom Atomic Power Station, Units 2 and 3, Inservice Inspection Program, SAI Report No. 186-028-14, August 27, 1982.
2. Letter, J. F. Stolz (NRC) to E. G. Bauer (PECo), May 2, 1983; transmits the attached SER on first interval program.
3. Letter, S. L. Daltroff (PECo) to J. F. Stolz (NRC), December 27, 1983; relief request on schedule to examine Unit 2 ECCS components and piping.
4. Letter, G. W. Rivenback (NRC) to E. G. Bauer, Jr. (PECo), June 1, 1984; grants schedule relief on examination of Unit 2 ECCS components and piping.
5. Letter, S. L. Daltroff (PECo) to J. F. Stolz (NRC), June 28, 1984; transmits the attached second interval program for both units.
6. Letter, J. F. Stolz (NRC) to E. G. Bauer (PECo), October 29, 1984; request for additional information.
7. Letter, S. L. Daltroff (PECo) to J. F. Stolz (NRC), December 21, 1984; partial response to request for information.
8. Letter, S. L. Daltroff (PECo) to J. F. Stolz (NRC), January 31, 1985; remaining response to request for information.
9. Letter, S. L. Daltroff (PECo) to J. F. Stolz (NRC), February 1, 1985; additional first interval relief requested.
10. SAIC, Technical Evaluation Report, Second Interval Inservice Inspection Program, Peach Bottom Atomic Power Station, Units 2 and 3. Report No. SAIC-84/1557, April 19, 1985.