March 15, 2000

Mr. James A. Hutton
Director-Licensing, MC 62A-1
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box No. 195
Wayne, PA 19087-0195

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION , UNITS NOS. 2 AND 3 - RESPONSE TO LICENSEE'S DISCUSSION OF ACTION ITEMS IDENTIFIED IN THIRD 10-YEAR INTERVAL INSERVICE TESTING PROGRAM AND SAFETY EVALUATION OF REQUESTS FOR THIRD 10-YEAR INTERVAL INSERVICE TESTING PROGRAM (TAC NOS. MA5047 AND MA5048)

Dear Mr. Hutton:

By letters dated May 8, 1997, and February 13, 1998, PECO Energy Company (PECO Energy) submitted the Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, Inservice Testing (IST) program for the third 10-year interval. The Nuclear Regulatory Commission (NRC) staff, with the technical assistance from Idaho National Engineering and Environmental Laboratory (INEEL), evaluated these submittals. The staff adopted the evaluations and recommendations for granting relief or authorizing alternatives contained in the Technical Evaluation Report (TER) prepared by INEEL, as reflected or modified in the May 11, 1998, safety evaluation (SE). The NRC granted the use of relief requests provided that the action items identified within the TER and SE were addressed within 1 year from the date of the SE or by the end of the next refueling outage, whichever is later. In a letter dated January 29, 1999, PECO Energy provided their response to the above action items and included items for the NRC staff to clarify or correct. The NRC staff's review of PECO Energy's response is contained in Enclosure 1 and concluded the following:

1) The NRC staff agrees that the editorial and administrative corrections identified by PECO Energy are appropriate. In addition, the revised dates of the third 10-year interval; extending from August 15, 1998, to August 14, 2008, are acceptable.

2) PECO Energy's responses to Action Item 1 of Request GVRR-7, Action Item 3 of Request 10-VRR-1, and Action Item 4 of Technical Position TP-1 in the May 11, 1998, SE, Section 2.5 are acceptable.

3) The NRC staff has reviewed the licensee's response to Action Item 2 of Request GVRR-7 in the May 11, 1998, SE, Section 2.5. The licensee's proposed method and criteria to provide definitive indication of the exhaust lines being drained are subject to NRC inspection to verify the adequacy of the alternative test.

4) The NRC staff finds that PECO Energy's response to Action Item 7 of Request 33-VRR-1, Action Item 10 of Technical Position TP-1 and Technical Position TP-3, and Action Item 11 of Technical Position TP-1 concerning anomalies in the May 11,1998, TER, Appendix A, to be acceptable.

5) The NRC staff finds that PECO Energy's correction of identified errata dealing with Issues 1, 2, 3, 5, 7, 8, and 9 in the May 11, 1998, TER, Appendix B, Program Issues, are acceptable.

6) PECO Energy's evaluation of Issue 4 in TER, Appendix B, Program Issues concerning scoping of certain residual heat removal relief valves is acceptable.

The licensee's January 29, 1999, letter also included the submittal of two new requests, 13C-VRR-1 and 23C-VRR-1; and additional information was provided concerning two previous requests, 33-VRR-2, Rev. 1, and GPRR-1, which were authorized for an interim period in the May 11, 1998, SE. The licensee's submittal was reviewed against the requirements of the American Society of Mechanical Engineers Operations and Maintenance Code - 1990 (ASME OM - 1990). The NRC staff's evaluation of these requests is contained in Enclosure 2. The SE concludes the following:

1) Request No. GPRR-1 is granted pursuant to 10 CFR 50.55a(f)(6)(i) for the remainder of the IST third 10-year interval. In making this determination, the staff has considered the impracticality of performing the required testing and the burden on the licensee if the requirements were imposed.

2) Alternatives proposed in Requests Nos. 13C-VRR-1 and 23C-VRR-1 are denied since the licensee has not shown that authorization of the proposed alternative is warranted pursuant to 10 CFR 50.55a(f)(5)(iii), or otherwise proposed an acceptable alternative pursuant to 10 CFR 50.55a(a)(3)(i) or (a)(3)(ii).

3) Alternative to the Code requirements proposed in Request No. 33-VRR-2, Rev. 1, is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the remainder of the IST third 10-year interval. In making this determination, the staff has considered that compliance with the Code would result in hardship without a compensating increase in the level of quality or safety.

The editorial and administrative corrections identified by PECO Energy and the approved action items as identified by the NRC are appropriate for implementation to PBAPS Units 2 and 3 IST program. The granting of implementation is based on fulfillment of PECO Energy's response in the January 29, 1999, letter. Additionally, the IST program requests that are granted or authorized herein are acceptable for implementation. The granting of relief or authorization of alternatives is based upon the fulfillment of any commitments made by PECO Energy in the basis for each relief request and the alternatives proposed.

If you have any questions regarding this matter, please contact the Peach Bottom Project Manager, Bartholomew C. Buckley, at (301) 415-1483.

Sincerely,

/RA/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-277 and 50-278

Enclosures: 1. NRC's Response to PECO Energy Letter dated January 29, 1999
2. Safety Evaluation

cc w/encls: See next page

If you have any questions regarding this matter, please contact the Peach Bottom Project Manager, Bartholomew C. Buckley, at (301) 415-1483.

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NRC's Response to PECO Energy's January 29, 1999, Letter

In a letter dated January 29, 1999, PECO Energy Company (PECO Energy) provided their response to the Nuclear Regulatory Commission's (NRC) May 11, 1998, safety evaluation (SE) concerning the third 10-year interval Inservice Testing (IST) program. Contained within this letter was PECO Energy's response to the action items identified in the SE and also included editorial and administrative items for the NRC staff to clarify or correct. The sections below contains the NRC staff's review and evaluation to the above mentioned items.

NRC's Response to PECO Energy - Identified Clarifications and Corrections

PECO Energy during its review of the cover letter, SE, and technical evaluation report (TER), dated May 11, 1998, identified items that needed NRC staff clarification or correction. The NRC staff's review of these editorial and administrative items are listed below.

The staff acknowledges the editorial errors in the cover letter, SE, and TER. These errors were identified as follows:

- on SE page 6, paragraph 2.1.1.3, change citation of Section 3.3.1 to 2.1.1.1;
- on SE page 7, paragraph 2.1.2.4, change citation of Section 2.1.2 to 2.1.1;
- in SE Table 1, add Request GVRR-7 to the list; and
- on TER page 1, first paragraph, change the licensee name from Philadelphia Electric Company to PECO Energy Company.

The licensee also indicated that the dates of its third 10-year IST interval were incorrectly stated in the May 11, 1998, cover letter, SE, and TER. The licensee stated that in its letter to the NRC, dated May 8, 1997, it extended the second 10-year IST interval to August 14, 1998, and identified the third 10-year interval to extend from August 15, 1998, to August 14, 2008. Our review indicates that the licensee had identified its extension of the third 10-year interval in its October 21,1997, letter. In that letter, the licensee requested that the NRC approve this extension. The NRC staff had not acted upon the licensee's extension request at the time of the issuance of its May 11, 1998, SE.

The licensee, in its letter of October 21, 1997, explained that the second 10-year interval was extended to provide additional time for implementing program revisions, and identified the third 10-year interval extending from August 15, 1998 to August 14, 2008. The staff's review indicates that it had previously approved a similar extension of the licensee's second 10-year interval for the inservice inspection (ISI) program. The staff has allowed extensions of IST program intervals for other licensees so that they may keep the same interval dates for both the ISI and IST programs. Therefore, the revised dates for the third 10-year interval, extending from August 15, 1998, to August 14, 2008, are acceptable.

The licensee questioned the statement in the SE: "Program changes that add or delete components from the IST Program should be periodically provided to the NRC." The licensee stated that it was not aware of any Code or regulatory requirement to do so and asked the staff to provide clarification. The licensee is correct in that there is no requirement for licensees to provide the NRC with a copy of its program revisions.

The licensee noted that the staff has erroneously listed the Standard Review Plan (SRP), Section 3.9.6 as a reference document for the review of its program. The staff acknowledges that PBAPS Units 2 and 3 were not initially reviewed in accordance with any SRP, and reference to SRP Section 3.9.6 is incorrect.

The staff agrees that the above mentioned editorial and administrative corrections are appropriate. The staff regrets any inconvenience that this may have caused PECO Energy.

NRC's Review of PECO Energy's Response to Action Items From the May 11, 1998, SE, Section 2.5

The NRC staff requested PECO Energy to address the action items listed in the May 11, 1998, SE, Section 2.5, within 1 year of the date of the SE or by the end of the next refueling outage, whichever is greater. PECO Energy's response was to describe the actions taken, actions in progress, or actions to be taken, to address each of the action items contained within the SE. The NRC staff's review of PECO Energy's response is contained below:

Action Item 1, Request GVRR-7

Action Item:
In request GVRR-7, the licensee should commit to declaring all four vacuum relief check valves:

VRV-2-13C-139A,B,C,D
VRV-2-23C-140A,B,C,D
VRV-3-13C-139A,B,C,D
VRV-3-23C-140A,B,C,D

in the high pressure coolant injection (HPCI) and the reactor core isolation cooling (RCIC) system inoperable in the event of a failure of the system to perform its function and apply corrective actions, as necessary, prior to returning the valves to service.

Evaluation:
The alternative proposed in GVRR-7 was authorized provided that; (1) all four valves in the system are declared inoperable in the event of a failure of the system to perform its function, and (2) corrective actions are taken prior to returning the valves to service. The licensee's addition of the sentence "[i]n the event of a test failure, the operability of all four valves will be evaluated" in the description of alternative testing, addresses the concern. This is acceptable.

Action Item 2, Request GVRR-7

Action Item:
The licensee should evaluate the check valve "open" acceptance criterion for the valves in request GVRR-7 because the current acceptance criterion does not appear to be definitive and sufficiently quantifiable.

Evaluation:
The safety function in the open direction of the HPCI and the RCIC vacuum relief check valves, is to equalize pressure between the torus air space and the turbine exhaust lines. This

prevents siphoning of suppression pool water into the exhaust lines. The acceptance criterion for the alternative test in the forward direction is to verify that the exhaust lines are drained. The licensee's proposed method and criteria to provide definitive indication of the exhaust lines being drained are subject to NRC inspection to verify the adequacy of the alternative test.

Action Item 3, Request 10-VRR-1

Action Item:
The licensee should review the scope requirements of the valves referenced in request 10-VRR-1, residual heat removal (RHR)/ low pressure coolant injection (LPCI) stay fill supply check valves, CHK-2(3)-10-183A(B), CHK-2(3)-10-184A(B) and the NRC guidance in NUREG-1482 to ensure that only one valve is required to fulfill the closure safety function and make any changes to their IST program as necessary.

Evaluation:
Since only one valve of the pair is required to close to perform its safety function, granting of the relief request is appropriate. The licensee's removal of the sentence, "[a]lthough, only one valve is required by design to provide isolation capability, testing these valves as a pair is preferable to valve disassembly and inspection," from the basis for relief, generated concern because relief is not appropriate if both valves are required to close in order to fulfill the safety function. The licensee's response allays this concern.

Action Item 4, Technical Position, TP-1

Action Item:
The licensee should evaluate the applicability of components referenced in TP-1 (emergency service water (ESW) booster pump check valves, CHK-0-48-504A,B) to the IST program and make any changes as necessary.

Evaluation:
TP-1 was evaluated as a relief request because the staff believed that the ESW booster pumps perform a safety function and should be included in the scope of the IST program. The staff determined that the proposed alternative testing was acceptable and granted relief from the test frequency requirements of ISTB 5.1 pursuant to 10 CFR 50.55a(f)(6)(i). The SE stated that the licensee should evaluate the applicability of components referenced in the technical position to the IST program. The licensee responded by saying that no components listed in TP-1 are credited for mitigation of any design-basis transient or accident and are augmented components. The staff finds this to be acceptable.

NRC's Review of PECO Energy's Response to Anomalies From the May 11, 1998, TER, Appendix A

The IST program requests which were granted or authorized in the May 11, 1998, SE were acceptable for implementation provided that the program anomalies identified in Appendix A of the TER were addressed within 1 year of the date of the SE or by the end of the next refueling outage, whichever is later, unless another period is specified. Appendix A of the TER documents inconsistencies and omissions in PBAPS Units 2 and 3 IST program, as found by INEEL. The NRC staff's review of PECO Energy's response is contained below:

Action Item 1, Request GPRR-1

Action Item:
The licensee submitted GPRR-1 for the listed diesel fuel oil transfer, emergency service water booster, and the emergency cooling water pumps. The licensee proposes to use ultrasonic instruments with an accuracy of plus or minus 5 percent of reading in lieu of the code accuracy requirements. Use of these instruments should provide sufficiently accurate and repeatable data to utilize in monitoring pump degradation. The burden on the licensee would not be justified by the limited information that would be provided concerning pump mechanical condition if the Code requirements were imposed. However, the licensee has not provided information on the pumps, pump test circuits, test flow rates, or the test instrument installation process to allow a thorough evaluation of the request. Interim relief should be granted from the Code instrumentation accuracy requirements for a period of 1 year or until the next refueling outage, whichever is longer.

Evaluation:
This request was granted for an interim period of 1 year. The supplemental information furnished by the licensee provides a basis for granting relief from the requirements of ISTB, Table 4.6.1-1 pursuant to 10 CFR 50.55a(f)(6)(i). This relief is granted for the remainder of the third 10-year IST interval. The staff's evaluation is located in Section 3.0 of the SE (Enclosure 2).

Action Item 2, Technical Position, TP-1

Action Item:
TP-1 requests relief from the pump test frequency requirements specified for the ESW Booster Pumps and proposes to test them once each year when the river temperature is less than or equal to 53 °F. Relief should be granted from the Code requirements as requested. However, TP-1 bases its justification on guidance in NUREG-1482, Section 3.1.1, which does not address pump testing or authorize or address the once-a-year test frequency. Further, TPs should not be used to obtain relief from the Code testing method or frequency requirements. TP-1 should be modified in the licensee's IST program to reflect the relief request evaluation.

Evaluation:
The staff's response to this anomaly is provided above in Action Item 4, TP-1.

Action Item 3, Request GVRR-1

In letter dated January 29, 1999, PECO Energy withdrew GVRR-1.

Action Item 4, Request GVRR-4

The licensee withdrew GVRR-4 and submitted two new requests. The staff's evaluation of 13C-VRR-1 and 23C-VRR-1 is located in Sections 2.2 and 2.3 of the SE (Enclosure 2). Both of these requests are denied.

Action Item 5, Request GVRR-5

In letter dated January 29, 1999, PECO Energy withdrew GVRR-5.

Action Item 6, Request GVRR-6

In letter dated January 29, 1999, PECO Energy withdrew GVRR-6.

Action Item 7, Request 33-VRR-1

The licensee deleted an inappropriate reference to NUREG-1482, Section 3.1.1. This is acceptable.

Action Item 8, Request 33-VRR-2

Action Item:
Request 33-VRR-2 requests relief from the stroke timing acceptance requirements for ESW cooling water flow isolation to the diesel generator air cooler jacket water cooler and lube oil cooler valves and proposes not to compare measured stroke times to the initial reference values but to use only the limiting values of stroke time. The licensee regularly adjusts the stroke length of these valves, which changes the valve stroke times and can result in failure to meet the acceptance criteria and result in unneeded corrective actions. Immediate compliance with the Code acceptance criteria requirements for these valves is impractical since it may result in unneeded maintenance or repair. Additionally, the constant attention given these valves should allow detection of degradation during the interim period. Therefore, interim relief should be granted in accordance with 10 CFR 50.55a(f)(6)(i) for a period of 1 year or until the next refueling outage, whichever is longer. At the end of that period, the licensee should test these valves in accordance with the Code requirements or justify an alternate method.

Evaluation:
This request was granted for an interim period of 1 year, based upon the impracticality of complying with the Code requirements. The supplemental information furnished by the licensee provides a basis for authorizing the proposed alternative to the requirements of ISTC 4.2.8 pursuant to 10 CFR 50.55a(a)(3)(ii). Therefore, the alternative is authorized for the remainder of the third 10-year IST interval. The staff's evaluation is located in Section 2.1 of the SE (Enclosure 2).

Action Item 9, Refueling Outage Justification 01-ROJ-1

The licensee deleted this refueling outage justification from the IST program and submitted it as Request 01A-VRR-1. The staff's SE dated October 1, 1998, authorized the proposed alternative testing method.

Action Item 10, Technical Positions TP-1 and TP-3

The licensee deleted the inappropriate references to NUREG-1482, Section 3.1.1, from the technical positions. This is acceptable.

Action Item 11, Technical Position TP-1

The licensee provided additional information on the basis for deferring testing of the emergency cooling water (ECW) pump discharge isolation valve, MO-0-48-0841, to once annually. Because this is an augmented component in the IST program, the staff has no objection to the licensee's position.

NRC's Review of PECO's Response to TER, Appendix B, Program Issues

In Appendix B of the May 11, 1998, TER, INEEL staff reviewed the RHR/LPCI and the ESW system. Following this review, the INEEL staff assessed the system for completeness. This was done in order to determine if additional components should have been included in the IST program. INEEL's review identified a list of issues to be addressed by PECO Energy. The NRC staff's review of PECO Energy's response is contained below:

Program Issue 1, 2, 3, 5, 6, 7, 8, and 9

The licensee's correction of the identified errata in the above program issues is acceptable.

Program Issue 4

Program Issue 4 concerns the scope of certain RHR system relief valves in the IST program. The licensee reviewed the function of the relief valves listed in the table on the bottom of TER page B-3 and the Code requirements for the IST program scope. It determined that relief valves, RV-35A(B), were incorrectly identified as not within the program scope. The valves are included in the third 10-year interval program scope and will continue to be tested in accordance with the Code requirements. This is acceptable.

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE THIRD 10-YEAR INSERVICE TESTING INTERVAL PROGRAM

PECO ENERGY COMPANY

PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3

DOCKET NUMBERS 50-277 AND 50-278

1.0 INTRODUCTION

Title 10 of the Code of Federal Regulations (10 CFR) Section 50.55a, requires that inservice testing (IST) of certain American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (the Code) and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for its facility. Section 50.55a authorizes the Commission to approve alternatives and to grant relief from ASME code requirements upon making the necessary findings. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provides alternatives to the Code requirements which are acceptable. Further guidance is given in GL 89-04, Supplement 1, and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants."

The third 10-year interval program for IST of pumps and valves at Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, began on August 15, 1998, and is scheduled to end on August 14, 2008. The program is based on the requirements of the ASME Operations and Maintenance (OM) Code-1990 in lieu of the 1989 Edition of ASME Section XI, Subsections IWP and IWV, which is referenced in 10 CFR 50.55a.

In a letter dated January 29, 1999, the licensee, PECO Energy Company, submitted two new relief requests (13C-VRR-1 and 23C-VRR-1) and provided additional information concerning two relief requests which were granted in the staff's May 11, 1998, safety evaluation (SE) for an interim period of 1 year (33-VRR-2 and GPRR-1). The staff's findings with respect to authorizing alternatives and granting or denying the proposed relief requests are given below.

2.0 VALVE REQUESTS

2.1 Request 33-VRR-2, Rev. 1

In 33-VRR-2, Rev. 1, the licensee proposes an alternative to the stroke time acceptance criteria of ISTC 4.2.8 for four valves in the emergency service water system. Instead of comparing the stroke time to the initial reference value for determining the acceptance criteria, the licensee proposes to establish a limiting stroke time of 20 seconds.

2.1.1 Basis for Requesting Relief

In its submittal the licensee states:

> AO-0-33-0241A(B,C,D) are normally closed air operated valves located in the outlet line from the emergency diesel generator (EDG) jacket water cooler. The valves perform an ACTIVE safety function in the OPEN position. They must be capable of automatically opening upon receipt of a diesel start signal. This function allows Emergency Service Water (ESW) cooling water flow to circulate through the air cooler, lube oil cooler, and the jacket water cooler to avoid damage to the engine due to overheating. The valves have no designated maximum design stroke time associated with its safety function in the open position. However, ESW flow must be provided to the engine within seconds of receiving a start signal. AO-0-33-0241A(B,C,D) fails to the open position on a loss of its non-safety related air supply or on a loss of 480V control power to the associated air supply solenoid valve.
>
> As a result of commitments made to the NRC concerning verification of design basis cooling water flowrates to the diesels, and in response to GL 89-13, a routine test is performed every 6 weeks. This test full-stroke exercises AO-0-33-0241A(B,C,D), verifies the valves will pass the required design flowrate, makes adjustments as required to ensure flowrates to individual EDGs are adequate, and balances flowrates between EDGs. The valves are provided with mechanical stops to allow adjustment of stroke length and, consequently, flowrate. Current valve stroke times range from 10 to 15 seconds as dictated by the testing described above. If adjustments are made to the valves(s) stroke length, the test procedure requires performance of stroke-time testing per IST Program requirements.
>
> As a result of GL 89-13 concerns, frequent adjustments in the stroke length of AO-2-33-0241A(B,C,D) are made. These adjustments would result in the need to frequently revise the stroke time acceptance criteria of ISTC 4.2.8 contained in the implementing IST surveillance test procedure. In addition to resulting in the need to revise the affected procedure, the flow verification/balancing could result in failure to meet the acceptance criteria specified in ISTC 4.2.8 and thus require subsequent corrective action per the requirements of ISTC 4.2.9(b). These corrective actions would not be warranted since the valves have been shown by visual observation and by verification of meeting design basis flowrates to be in good working order just prior to stroke timing. Due to the level of test activity associated with these valves, degradation would be detected without applying the stroke time acceptance criteria specified in ISTC 4.2.8. In addition, although not considered skid-mounted, the valves are also verified to be functioning properly by virtue of satisfactory diesel generator testing.

In summary, the discussion provided above demonstrates that the testing of AO-2-33-0241A(B,C,D) currently performed provides an acceptable level of quality and safety. In addition, compliance with the requirements of ISTC 4.2.8 would result in hardship (i.e., the costs associated with frequent procedure revisions and possible test failures) without a compensating increase in the level of quality and safety.

2.1.2 Alternative Testing

The licensee proposes:

A limiting stroke time of 20 seconds shall be established for AO-0-33-241A(B,C,D) in accordance with ISTC 4.2.4 and corrective actions shall be performed in accordance with ISTC 4.2.9. The stroke time acceptance criteria specified in ISTC 4.2.8 shall not be applied. The valves shall continue to be tested every six weeks as described above in accordance with PECO Energy commitments made to address issues identified in GL 89-13.

2.1.3 Evaluation

These 6-inch, Category B, air-operated globe valves open to direct ESW cooling flow to the diesel generator air cooler, jacket water cooler, and lube oil cooler. Paragraph ISTC 4.2.8 requires that the valves' stroke time results be compared to the initial reference values to determine the stroke time acceptance criteria.

The stroke length of these valves is regularly adjusted to compensate for changes in river temperature. This also changes the valves' stroke times, which can result in failure to meet the acceptance criteria and necessitates corrective actions according to Paragraph ISTC 4.2.9(b). This is a hardship because corrective actions are unnecessary when the valves were shown to be in good working order just prior to stroke timing. For these reasons, the licensee proposes an alternative testing method to establish a limiting stroke time of 20 seconds in accordance with ISTC 4.2.4 and perform corrective actions in accordance with ISTC 4.2.9.

In response to GL 89-13, these valves are subject to frequent routine testing. Due to the level of test activity, degradation of the valves would be detected from visual observation, by verification of meeting design-basis flow rates, and by satisfactory diesel generator testing.

For these reasons, the staff finds the proposed alternative testing method to provide reasonable assurance of the valves' operational readiness, and provides an acceptable level of quality and safety. Compliance with the specified requirements of ISTC 4.2.8 would result in hardship without a compensating increase in the level of quality and safety.

2.1.4 Summary

The proposed alternative to the requirements of ISTC 4.2.8 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the remainder of the third 10-year interval. Compliance with the specified requirements of this section would result in hardship without a compensating increase in the level of quality and safety.

2.2 Request 13C-VRR-1

In 13C-VRR-1, the licensee proposes an alternative to the quarterly exercise requirements of ISTC 4.5. Instead of verifying the closing capability of the check valves in the reactor core isolation cooling (RCIC) system quarterly, the licensee proposes to determine the frequency of this testing by using the leak rate test required by 10 CFR Part 50, Appendix J, Option B.

2.2.1 Basis for Requesting Relief

In its submittal, the licensee states:

> CHK-2(3)-13C-50 are 10-inch swing type check valves. They are not equipped with remote or local position indication. Verification of valve closure requires the installation of test equipment and performance of a seat leakage or reverse pressurization test.
>
> Currently, PBAPS satisfies the exercise testing requirement of the ASME Code by performance of the following tests:
>
> 1. Quarterly verification of exhaust line pressure less than 20 psig during HPCI [sic] pump testing for the forward exercise test.
>
> 2. Local Leak Rate Testing (LLRT) on a refueling outage frequency for the reverse exercise test (Refueling Outage Justification ROJ-13C-1).
>
> Recently, PBAPS implemented Option B of 10 CFR Part 50, Appendix J, which allows test frequencies to be adjusted based on performance. This has created a potential mismatch between the refueling outage frequency for testing CHK-2(3)-13C-50 for IST and the Option B frequency for the LLRT.
>
> Relief is requested to perform the reverse exercise test at the frequency specified by Appendix J, Option B. The bases for relief is two-fold 1) the proposed alternative provides an acceptable level of quality and safety, and 2) compliance results in hardship without a compensating increase in safety.
>
> The proposed alternative provides an acceptable level of quality and safety
>
> The only safety function performed by CHK-2(3)-13C-50 in the reverse direction is containment isolation. The exercising requirements of ISTC 4.5 verify the valve obturator has traveled to its seat on cessation of flow. In the case of CHK-2(3)-13C-65 [sic], a simple exercise test per ISTC 4.5 would not provide the data necessary to verify the ability of the valves to perform their Category A function. A leakrate or reverse pressurization test provides the necessary information. The Category A containment

isolation function is assured through performance of LLRTs. The PBAPS Primary Containment Leak Rate Test Program (PCLRT) provides for corrective actions, including test frequency adjustments, or valve repair or replacement if performance is poor.

As discussed in NUREG 1482, Section 4.1.4, the OM Code allows testing of check valves which require the installation of test equipment to be performed on a refueling outage frequency. Option B requires testing at a 30-month frequency (i.e., essentially on a refueling outage frequency based on a 2-year operating cycle and the need to be shutdown to perform the testing) unless performance history dictates a frequency extension. Good LLRT performance assures CHK-2(3)-13C-50 are functioning as required. In addition, the valves are exercised on a quarterly frequency during RCIC pump testing. While this quarterly exercising does not verify the valves are leaktight, it does provide some data indicating the valves are functioning properly.

As discussed above, CHK-2(3)-13C-50 are identified as containment isolation valve[s] for penetrations N-212 and N-217B. Penetration N-212 discharges below the minimum torus water level which would be seen under design-basis accident conditions. Therefore, for this penetration, the containment isolation function of CHK-2(3)-13C-50 is not required due to the presence of a water seal.

Penetration N-217B discharges into the torus air space. CHK-2(3)-13C-50 are credited as the outboard containment isolation valves with MO-2(3)-13C-4(5)244 credited as the inboard isolation valves. System design provides an additional barrier to containment leakage. Also, in the flowpath, and immediately downstream from and in series with CHK-2(3)-13C-50, are HV-2(3)-13C-9. These valves are locked open, lift type check valves with a handwheel to allow for manual closure. In the locked open position, the valve disc is free to lift and allow forward flow of turbine exhaust to the suppression pool. In the reverse direction (from the suppression pool), flow is over the valve disc, which aids in holding the disc against the seat. While no credit is taken for this function and the valves are not tested in the PCLRT Program, HV-2(3)-13C-9 provide an additional barrier to prevent primary containment leakage.

The discussion above demonstrates that 1) the PCLRT Program adequately ensures the operational readiness of CHK-2(3)-23C-65 [sic] to perform their containment isolation function, 2) system design provides for multiple barriers to preclude containment leakage in the event of a design basis accident, and 3) the existing testing provides an acceptable level of quality and safety.

<u>Compliance would result in hardship without a compensating increase in quality or safety</u>

Testing of CHK-2(3)-13C-65 [sic] at a refueling outage frequency will require the development of new test procedures to satisfy IST requirements or the performance of the associated LLRT every refueling outage even in the case of a good performance history. Additional testing costs and radiation exposure will also be incurred. The test takes 12-16 man-hours to complete. During refueling outages, manpower is at a premium, and work management and coordination is vital. Personnel safety and keeping radiation exposure As Low As Reasonably Achievable (ALARA) are also

important goals. Because leak rate testing at the Option B frequency provides adequate assurance of the check valves ability to perform the containment isolation function, there is not a compensating increase in the level of quality or safety achieved through more frequent reverse exercise testing.

2.2.2 Alternative Testing

The licensee proposes:

> CHK-2(3)-13C-50 will be exercised in the forward direction during quarterly HPCI [sic] pump testing, and in the reverse direction during the performance of leak rate testing in accordance with the PBAPS PCLRT Program.

2.2.3 Evaluation

These containment isolation check valves, CHK-2(3)-13C-50, perform their safety function in the closed direction. They are Category A/C valves that are Type C leak-rate tested at a frequency determined by Appendix J to 10 CFR Part 50. These valves cannot be verified to be in the closed position at a quarterly frequency because they do not have remote position indication and are located inside reactor containment. These check valves lack design provisions for system testing to verify closure capability in any plant condition. Verification of valve closure involves installation of test instrumentation and performance of a seat leakage or reverse pressurization test.

The ASME Code, paragraph ISTC 4.5.2, requires quarterly exercising of check valves with certain exceptions and allows testing of check valves as infrequently as once each refueling outage based on impracticality. The licensee proposes to assess the reverse flow closure capability of these valves at the frequency allowed by Option B of 10 CFR Part 50, Appendix J, as an alternative to exercising the valves according to the Code test frequency requirements.

The OM Code Committee recognizes the practicalities of performing testing during power operations and cold shutdown outages and allows testing to be performed during refueling outages. The need to set up test equipment is adequate justification to defer backflow testing of a check valve until a refueling outage. If no other practical means are available, it is acceptable to verify that check valves are capable of closing by performing leak-rate testing at each refueling outage.

The OM Committee also recognizes the benefits of performance-based testing of check valves. The 1996 Addenda to the ASME OM Code-1995 incorporates Appendix II, Check Valve Condition Monitoring Program, which allows changes to the test program based on component performance. Appendix II specifies that an analysis be performed of the test and maintenance history of a valve or group of valves in order to establish the basis for specifying the IST examination, and preventive maintenance activities. The analysis includes identification of any common failure or maintenance patterns, and review of these patterns to determine their significance and to identify potential failure mechanisms. The analysis is then used to identify the appropriate preventive maintenance, examination, test activities and interval for each valve. After performance of each activity, the results are reviewed to determine if any changes to the program are needed. Extending intervals for Option B does not involve the same engineering

analysis and does not provide reasonable assurance of the valves' functionality as required by the Code.

The OM Committee members have not approved the use of Option B of Appendix J as an alternative to the exercise frequency requirements of the OM Code. The alternative testing according to Option B of Appendix J, while adequate for the required periodic assessment of containment isolation valve leakage rate, has not been shown to be an adequate alternative to the exercise frequency requirements of the OM Code. Therefore, relief is denied.

2.2.4 Summary

The alternative proposed in 13C-VRR-1 is denied since the licensee has not demonstrated the impracticality of meeting Code requirements pursuant to 10 CFR 50.55a(f)(5)(iii), or otherwise proposed an acceptable alternative pursuant to 50.55a(a)(3)(i) or (a)(3)(ii).

2.3 Request 23C-VRR-1

In 23C-VRR-1, the licensee proposes an alternative to the quarterly exercise requirements of ISTC 4.5. Instead of verifying the closing capability of the check valves in the high pressure coolant injection (HPCI) system quarterly, the licensee proposes to determine the frequency of this testing by using the leak rate testing requirements of 10 CFR Part 50, Appendix J, Option B.

2.3.1 Basis for Requesting Relief

In its submittal, the licensee states:

> CHK-2(3)-23C-65 are 20-inch swing type check valves. They are not equipped with remote or local position indication. Verification of valve closure requires the installation of test equipment and performance of a seat leakage or reverse pressurization test.
>
> Currently, PBAPS satisfies the exercise testing requirement of the ASME Code by performance of the following tests:
>
> 1. Quarterly verification of exhaust line pressure less than 37 psig during HPCI pump testing for the forward exercise test.
>
> 2. LLRT on a refueling outage frequency for the reverse exercise test (Refueling Outage Justification ROJ-23C-1).
>
> Recently, PBAPS implemented Option B of 10 CFR 50 Appendix J which allows test frequencies to be adjusted based on performance. This has created a potential mismatch between the refueling outage frequency for testing CHK-2(3)-23C-65 for IST and the Option B frequency for the LLRT.
>
> Relief is requested to perform the reverse exercise test at the frequency specified by App. J Option B. The bases for relief is two-fold 1) the proposed alternative provides an acceptable level of quality and safety, and 2) compliance results in hardship without a compensating increase in safety.

The proposed alternative provides an acceptable level of quality and safety

The only safety function performed by CHK-2(3)-23C-65 in the reverse direction is containment isolation. The exercising requirements of ISTC 4.5 verify the valve obturator has traveled to its seat on cessation of flow. In the case of CHK-2(3)-23C-65, a simple exercise test per ISTC 4.5 would not provide the data necessary to verify the ability of the valves to perform their Category A function. A leakrate or reverse pressurization test provides the necessary information. The Category A containment isolation function is assured through performance of LLRTs. The PBAPS Primary Containment Leak Rate Test Program (PCLRT) provides for corrective actions, including test frequency adjustments, or valve repair or replacement if performance is poor.

As discussed in NUREG 1482, Section 4.1.4, the OM Code allows testing of check valves which require the installation of test equipment to be performed on a refueling outage frequency. Option B requires testing at a 30-month frequency (i.e., essentially on a refueling outage frequency based on a 2-year operating cycle and the need to be shutdown to perform the testing) unless performance history dictates a frequency extension. Good LLRT performance assures CHK-2(3)-23C-65 are functioning as required. In addition, the valves are exercised on a quarterly frequency during HPCI pump testing. While this quarterly exercising does not verify the valves are leaktight, it does provide some data indicating the valves are functioning properly.

As discussed above, CHK-2(3)-23C-65 are identified as containment isolation valve[s] for penetrations N-214 and N-217B. Penetration N-214 discharges below the minimum torus water level which would be seen under design basis accident conditions. Therefore, for this penetration, the containment isolation function of CHK-2(3)-23C-65 is not required due to the presence of a water seal.

Penetration N-217B discharges into the torus air space. CHK-2(3)-23C-65 are credited as the outboard containment isolation valves with MO-2(3)-23B-4(5)245 credited as the inboard isolation valves. An additional barrier to containment leakage is provided by HV-2(3)-23C-12, which is immediately downstream from and in series with CHK-2(3)-23C-65. These valves are locked open, lift type check valves with a handwheel to allow for manual closure. In the locked open position, the valve disc is free to lift and allow forward flow of turbine exhaust to the suppression pool. In the reverse direction (from the suppression pool), flow is over the valve disc, which aids in holding the disc against the seat. While no credit is taken for this function and the valves are not tested in the PCLRT Program, HV-2(3)-23C-12 provide an additional barrier to prevent primary containment leakage.

The discussion above demonstrates that 1) the PCLRT Program adequately ensures the operational readiness of CHK-2(3)-23C-65 to perform their containment isolation function, 2) system design provides for multiple barriers to preclude containment leakage in the event of a design basis accident, and 3) the existing testing provides an acceptable level of quality and safety.

Compliance would result in hardship without a compensating increase in quality or safety

Testing of CHK-2(3)-23C-65 at a refueling outage frequency will require the development of new test procedures to satisfy IST requirements or the performance of the associated LLRT every refueling outage even in the case of a good performance history. Additional testing costs and radiation exposure will also be incurred. The test takes 12-16 man-hours to complete. During refueling outages, manpower is at a premium, and work management and coordination is vital. Personnel safety and keeping radiation exposure as low as reasonably achievable (ALARA) are also important goals. Because leak rate testing at the Option B frequency provides adequate assurance of the check valves ability to perform the containment isolation function, there is not a compensating increase in the level of quality or safety achieved through more frequent reverse exercise testing.

2.3.2 Alternative Testing

The licensee proposes:

CHK-2(3)-23C-65 will be exercised in the forward direction during quarterly HPCI testing, and in the reverse direction during the performance of leak rate testing in accordance with the PBAPS PCLRT Program.

2.3.3 Evaluation

These containment isolation check valves, CHK-2(3)-23C-65, perform their safety function in the closed direction. They are Category A/C valves that are Type C leak-rate tested at a frequency determined by Appendix J to 10 CFR Part 50. These valves cannot be verified to be in the closed position at a quarterly frequency because they do not have remote position indication and are located inside reactor containment. These check valves lack design provisions for system testing to verify closure capability in any plant condition. Verification of valve closure involves installation of test instrumentation and performance of a seat leakage or reverse pressurization test.

The Code, ISTC 4.5.2, requires quarterly exercising of check valves with certain exceptions and allows testing of check valves as infrequently as once each refueling outage based on impracticality. The licensee proposes to assess the reverse flow closure capability of these valves at the frequency allowed by Option B of 10 CFR Part 50, Appendix J, as an alternative to exercising the valves according to the Code test frequency requirements.

The OM Code Committee recognizes the practicalities of performing testing during power operations and cold shutdown outages and allows testing to be performed during refueling outages. The need to set up test equipment is adequate justification to defer backflow testing of a check valve until a refueling outage. If no other practical means is available, it is acceptable to verify that check valves are capable of closing by performing leak-rate testing at each refueling outage.

The OM Committee also recognizes the benefits of performance-based testing of check valves. The 1996 Addenda to the ASME OM Code-1995 incorporates Appendix II, Check Valve Condition Monitoring Program, which allows changes to the test program based on component performance. Appendix II specifies that an analysis be performed of the test and maintenance history of a valve or group of valves in order to establish the basis for specifying IST,

examination, and preventive maintenance activities. The analysis includes identification of any common failure or maintenance patterns, and review of these patterns to determine their significance and to identify potential failure mechanisms. The analysis is then used to identify the appropriate preventive maintenance, examination, test activities and interval for each valve. After performance of each activity, the results are reviewed to determine if any changes to the program are needed. Extending intervals for Option B does not involve the same engineering analysis and does not provide reasonable assurance of the valves' functionality as required by the Code.

The OM Committee members have not approved the use of Option B of Appendix J as an alternative to the exercise frequency requirements of the OM Code. The alternative testing according to Option B of Appendix J, while adequate for the required periodic assessment of containment isolation valve leakage rate, has not been shown to be an adequate alternative to the exercise frequency requirements of the OM Code. Therefore, relief is denied.

2.3.4 Summary

The alternative proposed in 23C-VRR-1 is denied since the licensee has not demonstrated the impracticality of meeting Code requirements pursuant to 10 CFR 50.55a(f)(5)(iii), or otherwise proposed an acceptable alternative pursuant to 50.55a(a)(3)(i) or (a)(3)(ii).

3.0 PUMP REQUEST

3.1 Request GPRR-1

This generic relief request concerns the pump instrumentation accuracy requirements specified in ISTB, Table 4.6.1-1. The licensee proposes to measure flow using ultrasonic flow instrumentation calibrated to an accuracy within ±5 percent of reading for the diesel fuel oil transfer pumps, the emergency service water (ESW) booster pumps, and the emergency cooling water (ECW) pump. Interim relief was granted for a period of 1 year in the staff's May 11, 1998, SE. However, the licensee did not provide sufficient information for the staff to grant relief for the remainder of the third 10-year interval.

Supplemental information submitted in the licensee's letter of January 29, 1999, provides an acceptable basis to grant relief of GPRR-1 for the remainder of the third 10-year interval. The licensee states that for the diesel fuel oil transfer pumps, a review of the test history shows that pump hydraulic parameters are very repeatable. In addition, procedures used for testing the pumps contain instructions for personnel concerning the location for ultrasonic flow transducer installation.

Flow measurements from the ECW and ESW booster pumps are sufficiently repeatable as well. A modification was completed in 1991, to install a high-grade stainless steel spool piece to facilitate pump testing. The spool piece provides a well-defined pipe wall thickness and smooth flow paths and velocity profiles. These factors provide for consistent measurements of system flow rates and is evident from historical test data.

3.1.1 Summary

Relief from the requirements of ISTB, Table 4.6.1-1 is granted pursuant to

10 CFR 50.55a(f)(6)(i). The alternative testing provides reasonable assurance of operational readiness. Based on the impracticality of complying with the Code, and the burden on the licensee if those requirements were imposed, relief is granted for the remainder of the third 10-year interval.

4.0 CONCLUSION

Alternative testing is authorized for GPRR-1 pursuant to 10 CFR 50.55a(f)(6)(i). In making this determination, the staff considered the impracticality of performing the required testing and the burden on the licensee if the requirements were imposed.

R 13C-VRR-1 and 23C-VRR-1 are denied since the licensee has not shown that relief is warranted pursuant to 10 CFR 50.55a(f)(5)(iii), or otherwise proposed an acceptable alternative pursuant to 10 CFR 50.55a(a)(3)(i) or (a)(3)(ii).

The alternative to the Code requirements proposed in 33-VRR-2, Rev. 1 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the remainder of the third 10-year interval. Compliance with the Code would result in hardship or unusual difficulty without a compensating increase in the level of quality or safety.

Principal Reviewer: M. Kotzalas

Date: March 15, 2000

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