

IEB 80-13

**PECO NUCLEAR**

A Unit of PECO Energy

PECO Energy Company  
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Docket Nos. 50-277  
50-278License Nos. DPR-44  
DPR-56U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D.C. 20555Subject: Peach Bottom Atomic Power Station, Units 2 and 3  
Reactor Vessel Internals Examination Plans for the  
Core Spray Piping

Dear Sir:

This letter is in response to a September 4, 1996 telephone call between PECO Energy Company and the U. S. Nuclear Regulatory Commission concerning the implementation of the current guidance developed by the BWRVIP ("BWR Core Spray Internals Inspection and Flaw Evaluation Guidelines," BWRVIP-18, dated July, 1996) for the inspection of the Core Spray piping at Peach Bottom Atomic Power Station (PBAPS), Unit 2. This issue was the subject of an August 6, 1996 (G. A. Hunger, Jr. to USNRC) letter concerning this inspection, and the inspection of the core shroud. These inspections are intended to be performed during the upcoming eleventh refueling outage (2R11) scheduled to begin September 13, 1996. As a result of this call, PECO Energy Company was requested by the USNRC Project Manager (J. Shea) on September 6, 1996 to provide documentation of the PECO Energy Company discussion provided in the September 4, 1996 call. Additionally, we were requested to provide conclusions regarding the ability of the Core Spray System to continue to perform its intended safety function as a result of the revised inspections. Attached is our response to this request.

If you have any questions, please contact us.

Very truly yours,

G. A. Hunger, Jr.  
Director - Licensingcc: H. J. Miller, Administrator, Region I, USNRC  
W. L. Schmidt, USNRC Senior Resident Inspector, PBAPS9609240065 960912  
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**PECO ENERGY COMPANY  
PEACH BOTTOM ATOMIC POWER STATION  
UNITS 2 AND 3**

**REACTOR PRESSURE VESSEL INTERNALS  
AUGMENTED INSPECTION PROGRAM  
CORE SPRAY SYSTEM  
PBAPS Unit 2 2R11**

**BACKGROUND**

PECO Energy Company has been performing augmented examinations of the Core Spray System piping inside the reactor vessel, since 1980. The augmented inspection program for core spray internals was developed and implemented as a result of the requirements of USNRC I. E. Bulletin 80-13. During each refueling outage since 1980, Peach Bottom, Units 2 and 3 core spray piping and spargers have been visually examined for any indication of degradation. The visual examinations performed used a resolution standard of .001", as required by the Bulletin. The augmented inspection program also considered guidance suggested by General Electric Company's Service Information Letter (SIL) No. 289.

To date, PBAPS, Unit 2 examinations have revealed one crack-like indication at the "B" sparger pipe to tee box joint. This indication, discovered during the fifth refueling outage (1982) was repaired by the installation of a mechanical clamp which superseded the function of the subject weld, and precludes separation of the sparger pipe from the tee box. The cause of the as-found cracking was believed to be excessive cold working during fabrication and installation of the spargers. No other indications have been found on the PBAPS, Unit 2 Core Spray System piping or spargers.

Utilizing additional industry experience gained since 1980 in the area of examination, evaluation, analysis, and repair of this system, the Boiling Water Reactor Vessel and Internals Project (BWRVIP) developed a comprehensive guideline for the inspection and evaluation of this piping. This guidance, BWRVIP-18, "BWR Core Spray Internals Inspection and Flaw Evaluation Guidelines", was submitted to the USNRC for review on July 26, 1996. The intention of the VIP document is to supersede the GE SIL and IE Bulletin guidance for examination of this piping.

**PBAPS 2 PLANNING**

Considering the industry experience regarding core spray internals cracking contained in the VIP guidelines (i.e. Table 3-1) and PBAPS site specific experience with such cracking, the decision was made to enhance the existing augmented inspection program for the PBAPS Units 2 and 3 core spray internals, beginning with the eleventh refueling outage for Unit 2 (2R11). The basis for the change was to focus additional resources and time on the areas of the core spray piping which have shown a susceptibility to cracking (i.e. creviced welds), and to adjust examinations of areas not found to be susceptible to cracking (i.e. piping base metal). To achieve this enhancement, PECO Energy upgraded the existing Augmented Inspection Program 3 (AUG-03) to reflect the guidance provided in the VIP Guidelines (i.e. VIF-18).

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This upgrade was implemented by first itemizing and detailing all PBAPS specific susceptible areas on program tables and ISI drawings, as recommended by the VIP-18, Table 3-2. These susceptible areas were then assigned the VIP recommended examination technique. Both Ultrasonic Testing (UT) and Visual Testing (VT) techniques are described as options in the VIP-18. The visual technique was selected for the PBAPS, Unit 2 upcoming refueling outage (2R11), utilizing an enhanced resolution requirement of .0005". This technique identified as Enhanced VT-1 (EVT-1) was chosen because of the successful application of similar techniques during previous PBAPS inspections.

The examinations performed during the previous refueling outage at PBAPS, Unit 2 (2R10) were then reviewed and compared to the recommended baseline examinations of the VIP-18 document. The entire annulus piping portion of the core spray internals was inspected during 2R10. However, the examination technique utilized was not as rigorous. The technique used during 2R10 was equivalent to the CS VT-1, which requires only a .001" resolution. Therefore, the recommended baseline examinations were not satisfied and have been scheduled for implementation during the upcoming outage. Therefore, in accordance with Figure 3-1 of the VIP-18, all accessible core spray annulus piping welds have been scheduled for examination using the EVT-1 technique.

For the sparger portions of the core spray internals, the examinations performed during 2R10 included the recommended scope, and actually exceeded the recommended examination techniques. PBAPS is not "sparger geometry critical" as defined in Section 3.2.3 of VIP-18. All of the sparger piping, nozzles, and brackets were examined using the CS VT-1 (i.e. .001" resolution) technique. This technique is superior to that recommended for the nozzle welds and sparger brackets. Therefore, in accordance with Section 3.2 of the VIP-18, the baseline examination recommendations (Figure 3-2) for the sparger portion of the core spray internals have been satisfied during 2R10. Accordingly, the reinspection recommendations of the VIP-18 (Figure 3-4) were reviewed. The reinspection recommendations require examination of a specific scope of welds every two cycles. Accordingly, no examinations are required to be performed during the upcoming outage on this portion of the core spray internals. However, the repair clamp installed on the "B" sparger tee box has been scheduled for examination during 2R11. The examination technique for this component is the VT-1 technique.

The administrative and reporting requirements of the AUG-03 Inspection Program have not been revised. If cracks are discovered during the examinations, they will be identified to the USNRC Resident Inspector within 24 hours of their confirmation. All evaluations and repairs will be submitted to the USNRC for approval prior to restart.

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SUMMARY

Implementation of the upgraded Augmented Inspection Program 3 (AUG-03), during the 2R11 refueling outage, is considered an enhancement to the overall inspection program, as previously implemented.

Since superior visual examinations will be performed on all accessible weld locations of the core spray annulus piping, visible cracking in the welds and heat affected zones will be identified and evaluated for acceptability of continued service. If any cracking is identified in the lower welds of the piping downcomers (i.e. welds P5, P6, P7, and P4c), a mechanical repair clamp is available for installation on each of the four downcomers. The completion of this portion of the 2R11 examinations will assure the integrity of the annulus piping portion of the Core Spray System which is essential to delivering low pressure coolant into the shroud following a design basis Loss of Coolant Accident.

The visual examinations performed on the PBAPS, Unit 2 core spray spargers, nozzles and brackets each refueling outage since 1980, have detected only one crack-like indication. This area was considered to be more susceptible to degradation due to the unique conditions (i.e. cold working) applied to the location during original fabrication and installation. The indication has been repaired with a mechanical clamping device. Repeat examinations of corresponding areas of the PBAPS, Unit 2 spargers, performed during the five successive refueling outages, have identified no additional indications. Even in the unlikely event that cracking were to initiate in the spargers during the time frame between baseline inspections and reinspections, the significance of such degradation is considered to be low. This is due to the configuration and location of the spargers. Any degradation would not prevent injection of coolant inside of the core shroud, and inhibit the ability to reflood the inner volume. Disruption of spray distribution from the sparger would not significantly impact the cooling success criteria of the system.

PBAPS, Unit 2 reactor vessel internals have a low incidence of IGSCC cracking, as evidenced by the absence of any identified cracking in components such as the access hole covers and core spray piping. Additionally, comprehensive shroud weld examinations revealed minimum crack-like indications in shroud welds. This apparent lower susceptibility to the degradation mechanisms may be attributable to the current excellent chemistry control of the reactor coolant water. PBAPS, Unit 2 has consistently met or exceeded the EPRI guidelines for water chemistry control during power operations, since the early 1990's.

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The more refined examination technique to be used for the annulus region piping will enhance the ability to identify piping degradation. Acceptable results from previous inspections, an acceptable baseline inspection using the BWRVIP criteria during outage 2R10, and a history of no IGSCC on core spray spargers serve as the basis for implementing the reinspection criteria of VIP-18. The updated Augmented Inspection Program for Core Spray Internals will provide an acceptable level of assurance that the integrity and performance of the Core Spray System will meet its design requirements.