

U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket/Report No. 50-277/89-08
50-278/89-08

License No. DPR-44
DPR-56

Licensee: Philadelphia Electric Company
Correspondence Control Desk
P. O. Box 7520
Philadelphia, Pennsylvania 19101

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

Inspection At: Delta, Pennsylvania

Dates: February 18 to April 1, 1989

Inspectors: T. P. Johnson, Senior Resident Inspector
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Reviewed By: J. H. Williams
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4/6/89
date

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4/6/89
date

Summary

Areas Inspected: Routine, on site regular, backshift and deep backshift resident inspection (263.1 hours Unit 2; 201.9 hours Unit 3) of accessible portions of Unit 2 and 3, operational safety, radiation protection, physical security, control room activities, licensee events, surveillance testing, re-fueling and outage activities, maintenance, and outstanding items.

Results: Two violations were noted: (1) The licensee identified an inadequate surveillance procedure for neutron monitoring instrumentation (see section 6.2.1); and, (2) Failure to follow procedure A-8, Control of Locked Valves which occurred during emergency cooling tower (ECT) testing (see section 5.4). The ECT test performed on March 12, 1989 was not performed as an integrated test (see section 5.4). Additional testing with increased management oversight is necessary to demonstrate ECT operability. Two LERs were noted as having incomplete information (see sections 6.2.3 and 5.4). Licensee corrective actions to resolve NRC open items required for restart were reviewed.

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DETAILS

1.0 Persons Contacted

- *C. E. Andersen, Staff Engineer, Technical
- G. A. Bird, Nuclear Security Specialist
- J. B. Cotton, Superintendent, Operations
- *T. E. Cribbe, Regulatory Engineer
- G. F. Daebeler, Superintendent, Technical
- *J. F. Franz, Plant Manager
- *G. J. Hanson, Regulatory Group
- D. P. LeQuia, Superintendent, Services
- D. R. Meyers, Support Manager
- F. W. Polaski, Assistant Superintendent, Operations
- K. P. Powers, Peach Bottom Project Manager
- *J. M. Pratt, Manager, Peach Bottom QA
- G. R. Rainey, Superintendent, Maintenance
- D. M. Smith, Vice President, Peach Bottom Atomic Power Station

Other licensee and contractor employees were also contacted.

*Present at exit interview on site and for summation of preliminary findings.

2.0 Facility and Unit Status

2.1 Unit 2

The unit remained in cold shutdown during the period. System maintenance and testing continued during the inspection period in order to support restart requirements. An emergency cooling tower test was performed during this period.

2.2 Unit 3

The unit remained defueled during the inspection period. Plant modifications, corrective and preventive maintenance, and system testing were performed.

3.0 Previous Inspection Item Update (92701, 92702)

- 3.1 (Closed) Inspector Follow Item (277/85-08-04, 278/85-08-04). Intergranular stress corrosion cracking (IGSCC) of a Unit 2 control rod drive unit scram outlet valve (13-112). This item was reviewed in NRC Inspection 277/86-14, 278/86-15. The remaining issues were susceptibility of the Unit 3 valves even though they are of a different vendor. The licensee's metallurgical group has concluded that the Unit 3 valves are also susceptible. As part of the preventive

maintenance program, the licensee has implemented a program to disassemble and inspect 10% of the Unit 3 valves each refueling outage. No IGSCC has been noted to date. As part of a long term program, the licensee is considering replacement of the valve wedge and stem with a non-susceptible material. The inspector will review this item in a future inspection. The inspector follow item is considered closed.

- 3.2 (Closed) Unresolved Item (50-277/88-41-01; 50-278/88-41-01). Fire dampers required to be inspected by Technical Specifications (TS) were not done. The inspector identified two fire dampers required by TS to be inspected that were not included in surveillance test (ST) 16.22, "Fire Damper Inspection". The licensee reviewed all fire dampers and determined that 17 additional dampers were missing from ST 16.22. The licensee inspected all 19 dampers and 18 were found acceptable. One damper would not fully close by two inches, but was determined to be of minor safety significance. All 19 dampers were added to ST 16.22 and all STs controlled by the fire protection section were reviewed for technical adequacy. This item is closed.
- 3.3 (Closed) Unresolved Item (50-277/88-34-03; 50-278/88-34-03). Diesel driven fire pump surveillance test adequacy. The licensee determined that the outdated version of ST 6.17, "Diesel Driven Fire Pump Operability Test" that was in the possession of the non-licensed operator was issued to him by the shift STA. The STA did not get a current revision from the procedure book; instead he issued the non-licensed operator a copy of ST 6.17 that was lying in his office. The incident was minor in nature because the outdated revision only differed in wording in several procedural steps. The STA was counseled regarding his actions. ST 6.17 is being revised to incorporate diesel engine parameters that existed in system procedure S.13.2.1.F, "Routine Inspection of Fire Protection Water System". Also, non-licensed operator round sheets will have fire pump parameters added to be monitored each day. Finally, procedure A-3, "Temporary Changes to Procedures," is being revised to better control temporary changes to surveillance tests until a permanent revision is issued or until the temporary change is cancelled. This item is closed.
- 3.4 (Closed) Unresolved Item (277/87-15-02). Inattentive security guard at the drywell entrance. The licensee has replaced the security contractor and initiated other enhancements to the security program. A security team inspection (277/89-80, 278/89-80) and recent resident inspections have not found any inattentiveness. Based on this, the unresolved item is closed.
- 3.5 (Closed) Unresolved Item (277/88-42-05). Unit 2 suppression pool (torus) penetrations were found not welded or testable. On December 22, 1988, the licensee made a four hour notification to the NRC regarding two penetrations discovered in the Unit 2 suppression pool that did not meet General Design Criteria (GDC) No. 53, Item 3 or FSAR Appendix H requirements. Penetration N209A is a one inch

diameter instrument penetration that was found sealed with a threaded cap but not welded. Penetration N250 is an eight inch spare test nozzle that was found sealed with a blank flange but was not testable for leakage.

The licensee concluded that the as found condition of these penetrations would not constitute a reportable event. This conclusion was based on an evaluation that the penetrations were leak tight and would not compromise the containment function or integrity as demonstrated by previously successful Unit 2 integrated leak rate testing.

However, to meet GDC and FSAR commitments, the licensee welded the threaded cap of penetration N209A per maintenance request form (MRF) 8812358 and penetration N250 was made testable per MRF 8812360. A surveillance procedure, ST 20.152, was prepared and implemented to test penetration N250 for leakage. A test was satisfactorily performed on December 30, 1988.

The unresolved item is considered closed and no unacceptable conditions were noted.

- 3.6 (Open) Unresolved Item (277/89-81-04; 278/89-81-04). The capability of the emergency cooling tower system to function as designed (see section 5.4).
- 3.7 (Closed) Unresolved Item (277/88-42-04; 278/88-42-04). I&C group direction for double and independent verification. Subsequent to this incident the involved I&C technicians were counselled by the I&C supervisor, who also questioned numerous other I&C technicians concerning their understanding of double and independent verification. These other individuals apparently understood the proper meaning of double and independent verification. Therefore, this appears to have been an isolated incident. In addition, a training tape covering double and independent verification was shown to all I&C technicians at an all-hands meeting. The Plant Manager also issued a two page memo to site personnel that explained the meaning of double and independent verification. The inspector determined that these short term corrective actions adequately addressed the unresolved item. For long term corrective actions the licensee will add proper definitions to current procedures and guidelines. These definitions for double and independent verification will also be standardized for all site work groups (I&C, Operations, Maintenance, etc.) and between PECO facilities.
- 3.8 (Closed) Unresolved Item (277/86-25-11). Unrestrained items in the switchgear room and loose equipment in the plant. This item was reviewed in NRC Inspection 277/87-34 and remained open pending completion of licensee actions. The licensee has restrained spare breakers and grounding trucks in the switchgear rooms by blocking

their wheels. Other equipment in the plant now have specific restraining storage areas. A recent revision to procedure A-30, Plant Housekeeping Controls, Rev. 7, section 7.1.12.2 requires that loose equipment not be left in plant vital areas. The inspector verified these corrective actions and this item is considered closed.

- 3.9 (Closed) Unresolved Item (277/88-13-06). Adequacy of Protected Area (PA) Drawings. The licensee reviewed their PA drawings. Specific deficiencies were noted and applicable drawings were made part of the Security Plan. The specific area was also posted with a sign and security post orders were modified to ensure this area was inspected routinely. Based on these licensee actions, the unresolved item is considered closed.
- 3.10 (Closed) Unresolved Item (277/89-81-02; 278/89-81-02). Prior to restart provide to the appropriate HP technicians orientation of training in the area of Peach Bottom power operations experience and radiological expectations (see section 9.2).
- 3.11 (Closed) Unresolved Item (277/87-29-02; 278/87-29-02). GE 4KV breaker (AM 4.16-250) problems. The 4KV breakers were reviewed during NRC Inspection 277/89-07; 278/89-07. Section 5.6.1 of this report adequately addressed these breaker problems and concerns. This item is considered closed.

4.0 Plant Operations Review

4.1 Operational Safety Verification and Station Tours (71707)

The inspector completed the requirements of NRC Inspection Procedure 71707, "Operational Safety Verification," by direct observation of activities and equipment, tours of the facility, interviews and discussions with licensee personnel, independent verification of safety system status and limiting conditions for operation, corrective actions, and review of facility records and logs.

During a routine tour on March 22, 1989, the inspector noted deficiencies associated with two junction boxes (J-553 and J-554) located above the TIP room in Unit 2 at plant elevation 135. The junction box doors were removed, a ladder was resting on the junction boxes, and many of the cable and wires appeared to be loose and were not terminated. The inspector confirmed that these junction boxes were safety related and were associated with electrical division 1 drywell cables.

Further follow-up by the inspector noted that about two weeks earlier a licensee routine housekeeping tour had noted similar conditions for this area. However, these conditions had neither been formally

documented nor had actions been initiated to correct them. The inspector discussed this item with plant management. Management initiated actions to identify the status of these junction boxes. The licensee confirmed that all of the loose cables and wires were spares. The reason for the doors being off was indeterminate. The licensee initiated maintenance request forms to better identify and to store the spare cables in the junction boxes, and to replace the junction box doors.

The inspector concluded that the licensee's program to identify plant deficiencies is adequate. However, in this instance, the inspector identified potentially significant deficiencies associated with safety related junction boxes J-553, 554 were not brought quickly to management's attention. Once the inspector informed management of these conditions, immediate and effective corrective actions were taken.

4.2 Logs and Records (71707)

The inspector reviewed logs and records for accuracy, completeness, abnormal conditions, significant operating changes and trends, required entries, correct equipment and lock-out status, jumper and alteration log validity, conformance with Limiting Conditions for Operations, and proper reporting. The following logs and records were reviewed: Control Room Shift Supervisor Log, Unit 2 Reactor Operator Log, Unit 3 Reactor Operator Log, Control Operator Log, STA Log, QC Shift Monitor Log, Radiation Work Permits, Locked Valve Log, Maintenance Request Forms, Temporary Plant Alteration Log, Special Procedures Log, Information Tag Log, Annunciator Mode Log, Plant Status List, and Ignition Source Control Checklists. Control Room logs were compared with Administrative Procedure A-7, Shift Operations, and the Operations Manual. Frequent initialing of entries by licensed operators, shift supervision, and licensee site management constituted evidence of licensee review. With the exception of the locked valve log and associated controls (see section 5.4), no unacceptable conditions were identified.

4.3 System Operating (SO) Procedures (42700)

The inspector reviewed the licensee's SO procedure project during NRC Inspection 277/89-81, 278/89-81. These procedures replace the former "S" system operating procedures. A concern was raised regarding the schedule for completing these new SO procedures to support safety systems startup for Unit 2.

The licensee modified their priority for SO procedure completion. The HPCI and RCIC systems, as well as other selected safety related SO procedures are now scheduled for implementation prior to Unit 2

restart. The licensee intends to complete some selected systems' SO procedures after the scheduled Unit 2 restart based on the following criteria:

<u>System(s)</u>	<u>Licensee's Justification</u>
A. Circulating water Turbine building ventilation Radwaste processing Service Water Fuel pool cooling Condensate transfer Auxiliary steam	A. S procedures adequate and these non-safety related systems are currently in service supporting plant operations.
B. Unit 3 offgas Unit 3 process computer	B. Unit 3 procedures are not needed for Unit 2 restart.
C. Hydrogen water chemistry	C. System not scheduled to be in service for Unit 2 restart.
D. Electrical distribution, substations and transformers	D. Current S procedures are adequate. Also, some new SO procedures (no S currently exists) for system check-off-lists (COL) are adequately addressed in system specific SO COLs.

The inspector reviewed the licensee's revised schedule, including their rationale for delaying specific SO procedures after Unit 2 restart. The inspector noted that some of these procedures are already drafted and are scheduled for PORC review. The inspector also reviewed the index for these SOs and confirmed that an S procedure exists in most cases. The exception is in the area of electrical SO procedure COLs. These procedures have never previously existed. Their primary purpose is to provide a readily available load list for the operators (other than electrical drawings). Specific electrical breaker position and line up checks are currently addressed in the respective plant system SO procedure COL. The inspector confirmed this by selecting a sample of electrical breakers and verifying that they were addressed in the new SO procedure COL for that specific system.

In summary, the inspector concluded that the licensee's revised SO procedure schedule was adequate to support Unit 2 restart. The SO procedures continue to be a quality product. The inspector will continue to review the SO procedure project and implementation.

4.4 Public Address (PA) System Changes (37700)

The plant public address (PA) system was modified by a major functional change on March 21, 1989. The PA system is now capable of only broadcasting announcements made from the Control Room, Security Stations and the Operations Support Center. As a result, communications required to facilitate normal work activities have to rely on radio and telephone equipment. Plant personnel are now required to restrict use of in-plant PA stations to reporting of emergencies only. The only locations that can hear the pages from in-plant PA stations are the Control Room, the Operations Support Center and Security Stations.

The inspectors noted an immediate decrease in PA system activity and abuse. This area will continue to be reviewed in future inspections.

4.5 Unit 2 Drywell Tour (71707)

On March 31, 1989, the inspectors made a tour of the Unit 2 drywell prior to the planned licensee final inspection and subsequent closeout. This NRC inspection included a review of the following items:

- HP controls, postings, radiation levels, etc.,
- work in progress, including open MRFs,
- housekeeping and cleanliness, including graffiti,
- material and equipment conditions,
- equipment trouble tags, and
- snubbers and supports.

Overall, the drywell condition was good. Specific noted minor deficiencies were discussed with licensee engineering personnel. Prior to final closeout, the licensee intends to perform a drywell inspection in accordance with their closeout procedures. The inspector will review this licensee final closeout including documentation in a future inspection.

5.0 Engineering and Technical Support Activities

5.1 Licensee Assessment of Unit 2 Small Bore Piping (37700)

On February 15, 1989, licensee representatives met with NRC inspectors at the NRC Region I office to provide an update on their ongoing activities to assess the adequacy of small bore pipe and pipe support configurations. Licensee hand-outs used at the meeting are included

as Attachment 1 to this report. This program was a licensee initiative and involves assessment of safety-related (Q) piping with diameters of 3 inch and smaller. The program included licensee walkdowns of a sample of selected piping isometric drawing packages and evaluations to identify any abnormal conditions. The sample selected for walkdown inspections was directed toward piping runs with attributes such as high temperature, pressure, concentrated weights and junctions of Q and non-Q piping. Fifty piping isometric drawing packages from Unit 2 were selected by the licensee for walkdown and evaluation.

Based on the as-found condition, selected segments of pipe were modeled and analyzed using ASME code procedures. These analyses identified two drain lines overstressed due to thermal loads and one non-drain line overstressed due to seismic and thermal loading. Two of these conditions were attributed by the licensee to failure to adequately consider thermal expansion stresses during the original design and construction of the two lines. No procedural errors suggesting that this might have been a programmatic problem were identified. Modifications were made to reduce the calculated stresses to within ASME code requirements. Also, the licensee is performing more sophisticated piping analyses to demonstrate that functionality of the piping would not be adversely affected by similar calculated overstress conditions.

The third overstressed condition occurred because the drain lines were welded into the drain funnels and to assure the lines would drain into the funnels and not create a flood hazard. However, the anchor point at the drain funnels was not included in the piping stress analysis models. The licensee indicated that all such conditions would be identified and corrected in both Units 2 and 3 prior to respective unit restart.

The licensee stated that an expanded program for both Units 2 and 3 was being developed based on the results found to date. The NRC inspectors requested to be kept informed of the licensee's progress in this area and specifically requested that results of the functionality analysis and a description of the expanded program be provided when completed. This area will be reviewed in a future inspection.

5.2 Electrical Wiring Problems (62703)

On February 7, 1989, at 2:00 p.m., licensee construction personnel found a broken wire in the E-2 diesel generator (DG) junction box J-420. The wire was disconnected from its lug on terminal strip #31. Licensee investigation determined that this broken wire was associated with the E-22 breaker closure circuitry. Additional licensee inspections in J-420 found three other wires with broken strands. The licensee repaired these broken wires that evening.

A licensee critique was held on February 8 and 9, 1989. At these meetings additional inspections were directed for DG junction boxes and control panels in the 4 KV switchgear room and in all DG rooms. Approximately 25 additional wires were noted as having cut strand damage. Nonconformance reports (NCR), Maintenance Request Forms (MRF) and Engineering Work Requests (EWR) were initiated for these conditions.

The licensee determined that the wire damage was attributed to tools and work practices in use during initial plant construction. In addition, the licensee noted that no recent wiring installations from modification work were affected. Construction and field engineering personnel have been looking for wiring problems. The inspector noted that a surveillance test (ST 9.36, "Inspections of Critical Electrical Panels") had been developed in September 1988 to be performed once per cycle to inspect for wiring and electrical defects.

The inspector attended the critique; reviewed preliminary upset report and final incident report 2-89-07; reviewed associated MRFs, NCRs, and EWRs; inspected a portion of junction boxes and electrical panels in the plant; reviewed associated electrical schematic and wiring diagrams; and, reviewed completed ST 9.36. The EWR concluded that the individual wires without strands were functionally capable of performing their safety function. However, the licensee initiated MRFs to repair each wire. The inspector verified that these wires were repaired.

5.3 Fuel Failures (71707)

The inspector attended a licensee meeting on March 13, 1989, to discuss the Limerick leaking fuel problem and its potential effect on Peach Bottom. Limerick fuel (reload 1) experienced a number of fuel failures apparently caused by crud induced localized corrosion (CILC). The licensee believes that CILC occurred due to a high copper concentration in the reactor feedwater combined with a potential fuel manufacturing defect which could not be identified by the material tests used at the time of manufacture. Peach Bottom Unit 2 reload 7 fuel (currently in the core) was manufactured at the same time as the Limerick fuel. However, the licensee believes that Peach Bottom should not experience fuel problems. This is based on: (1) lower copper concentration at Peach Bottom Unit 2 (0.2 ppb vs. 0.6 ppb); (2) Unit 2 has never experienced CILC; and, (3) different cladding lot than the Limerick fuel. In addition, an archive test (MATAR) will be performed to check that the Peach Bottom fuel is not susceptible.

An additional meeting to discuss these fuel failures was held at NRC headquarters on March 15, 1989. The inspector will review this area in future inspections. Reactor and feedwater chemistry, and offgas radiation levels will be closely monitored.

5.4 Emergency Cooling Tower (ECT) (37700, 37828, 71707)

NRC Inspection Report 277 and 278/89-81, section 3.7.4 discusses the ECT and ESW/ECW systems and notes that the system's capability to function as designed must be demonstrated before restart. The emergency service water (ESW) system is common to both Units 2 and 3. The system consists of two full capacity pumps installed in parallel in the seismic Class I portion of the pump structure. The system has sufficient capacity and redundancy so that no single active component failure can prevent the system from achieving its safety objective. Redundancy is provided in the number of pumps and the piping arrangement. The emergency cooling water (ECW) system includes the ECT. The system provides on-site heat removal capability so that both units can be shut down in the event of unavailability of the normal heat sink (Conowingo Pond). In addition to the ESW, the high pressure service water (HPSW) system utilizes the ECT as a heat sink.

The licensee performed special procedure SP-630-2, "Integrated Test of the Unit 2 ECW System", on March 12, 1989. The following functions of the ECW system were planned to be tested:

- level control using the Unit 2 letdown line,
- ESW/ECW cooling water flow to the diesels, safeguards room coolers and other auxiliaries,
- ability of Unit 2 letdown line to pass design flow of 17,000 gpm, and
- ability of ECW pump to provide back-up to the ESW pumps.

A large number of steps (approximately 20%) were omitted while performing the test and the test was labelled "partial". Members of the licensee staff indicated that the test was not meant to be an integrated test and they planned to use a completed surveillance test (ST 13.21) performed in August 1988 to fulfill the omitted test requirements. After a review of SP-630-2, the inspector expressed a number of concerns to the licensee including:

- (1) Major system components were not tested; and, the apparent intention to do an integrated test was not met.
- (2) A large number of temporary changes to the special procedure were made. This included eliminating steps to tune the level controllers. This tuning was noted as an important step in startup test #95 (1973) and in an engineering evaluation for the 1988 ECT test.
- (3) Operator access to the ESW booster pumps for throttling adjustments is questionable because the ESW booster pumps are located in the diesel generator building which is protected from the design basis flood by water tight doors and grade elevation is about ten feet below the maximum flood elevation.

- (4) Administrative procedure A-8, Control of Locked Valves was apparently not followed. Steps 118 and 119 of SP-630-2 required HV-0-48A-505A and B to be opened and locked. These ESW booster pump discharge valves are locked open valves and are administratively controlled by procedure A-8. SP-630-2 was changed to require verification that the valves were locked in the throttled position (40-50% open). Procedure A-8 prescribes methods used to control locked valves including the requirement that all valves shown locked on the P&IDs shall be maintained in the locked condition unless operations in progress require otherwise. HV-0-48A-505A and B are shown on P&ID M-330 in the locked open position. Additionally, the safety evaluation, revision 2, for SP-630-2 states that all temporary configuration changes are restored to their original condition upon completion of the test. The licensee returned the valves to the fully locked open position in the late afternoon on March 14, 1989, after the inspector raised the concern. In addition, the licensee found upon further review that the valve repositioning had not been entered into the locked valve logs as required by procedure. On Friday, March 17, 1989, the licensee held a critique of this event. Other corrective actions taken or planned include counselling individuals involved, providing guidance on temporary changes to procedures, and review and revise as needed the procedure governing temporary changes to procedures.

Failure to restore the ESW booster pump discharge valves to the locked open position is an apparent violation of procedure A-8 (277/89-08-01). However, in view of the prompt and thorough corrective actions taken and planned by the licensee, no Notice of Violation will be issued and no further response by the licensee is necessary.

The inspector held discussions with licensee engineering and management regarding the intent of SP-630-2 and whether it was an integrated test. The inspector also reviewed documents and earlier ECT tests for their purpose and content. Attachment 2 summarizes these tests as they were meant to be performed.

Operating difficulties stopped earlier tests before system integrated performance could be demonstrated. The minutes of a PECO Nuclear Review Board (NRB) meeting held on March 2, 1989, discusses ESW/ECW testing to ensure operability. In addition to more frequent testing, the NRB directed an integrated test be performed once every third refueling outage and an operability test each operating cycle. The inspector concluded that an ECT

integrated test was planned, but because of difficulties, the licensee focused on resolving some of the identified problems in the last test.

The inspector reviewed ST 13.21 completed August 27, 1988, which tested the operability of the ECW pump, ECT fans, and ESW booster pumps. Because of ESW booster pump tripping problems, the ST procedure had a number of temporary changes. The ESW booster pump tripping problem is a long standing problem identified in 1973.

The inspector also reviewed LER 2-89-02. Questions were raised about the completeness of the LER with regard to Unit 2 emergency cooling water and tower operability. The licensee concluded that the Unit 2 system was operable. The ESW/ECW systems are common to both units. A number of problems have been found by the licensee that impact system operability which appeared not to be considered in the operability determination, such as level controller calibration and operation, seismically qualified power supplies, structural integrity and venting capacity of the pump structure. In addition, the licensee has an engineering evaluation, and an Independent Safety Engineering Group (ISEG) report that concluded the systems are inoperable. The ISEG report concluded that to date the ECW system has not been demonstrated to perform its design function per FSAR section 10.24. ISEG recommended an integrated test of the ECW system be developed and performed to demonstrate that all flowpaths including the HPSW pump bay path are capable of performing their design function. They also recommended both HPSW pumps and paths should be tested.

The inspector concluded that an integrated test which demonstrates operability had not been done. Rather, the affected systems were tested in parts with the understanding that adding up the individual tests is equivalent to an integrated test. This logic is under review by the inspector. The basis for the conclusion that Unit 2 ESW was operable needs to be clarified in view of the conflicting information. This item remains open.

6.0 Review of Licensee Event Reports (LERs)

6.1 LER Review (90712)

The inspector reviewed LERs submitted to the NRC to verify that the details were clearly reported, including the accuracy of the description and corrective action adequacy. The inspector determined whether further information was required, whether generic implications were indicated, and whether the event warranted on site follow-up. The following LERs were reviewed:

<u>LER No.</u>	<u>LER Date</u>	<u>Event Date</u>	<u>Subject</u>
*2-89-01	2/22/89	1/20/89	Surveillance testing deficiencies
*2-89-02	3/6/89	3/2/89	Emergency Water System Design Problems
*2-89-03	3/8/89	2/7/89	PCIS Group 2C and Reactor Scram While Shutdown
2-88-24, Rev. 1	3/3/89	10/6/88	Fire Protection Technical Specifications Surveillance Requirements not met
2-88-32, Rev. 1	3/30/89	12/12/88	Control Room Habitability

6.2 LER Follow-up (92700)

For LERs selected for follow-up and review (denoted by asterisks above), the inspector verified that appropriate corrective action was taken or responsibility was assigned and that continued operation of the facility was conducted in accordance with Technical Specifications and did not constitute an unreviewed safety question as defined in 10 CFR 50.59. Report accuracy, compliance with current reporting requirements and applicability to other site systems and components were also reviewed.

6.2.1 LER 2-89-01 concerns a licensee identified Technical Specification (TS) surveillance test (ST) inadequacy for portions of intermediate range monitor (IRM) and source range monitor (SRM) inputs into the control rod block instrumentation. TS Table 4.2.C items were affected as follows: Items 3 (IRM upscale), 4 (IRM downscale), 7 (SRM upscale), 8 (SRM not inserted), and 9 (IRM not inserted). The licensee determined that appropriate instrument functional testing is performed; however, the TS require an instrument calibration. The licensee submitted a TS change on March 10, 1989, to make Peach Bottom TS consistent with standard TS. (Standard TS do not require a channel calibration prior to startup.) The licensee determined that

the consequences of this event were minimal. This was because these instruments have never exceeded any TS limits.

The inspector reviewed the LER and associated TSs and STs. The inspector verified that adequate instrument functional tests exist and are performed for the above requirements. This is a licensee identified violation of TS 4.2.C (277/89-08-02; 278/89-08-02). The inspector concurred that it is of minor safety significance. The inspector will review the TS change in a future inspection. NRC review of the overall ST program adequacy was performed in NRC Inspection 277/89-81; 278/89-81. The licensee continues to be aggressive in finding surveillance deficiencies.

- 6.2.2 LER 2-89-02 concerns the design inadequacies of the emergency cooling tower and emergency cooling water system. See section 5.4.
- 6.2.3 LER 2-89-03 concerns a shutdown scram and containment isolation that occurred on February 7, 1989. The event was reviewed in NRC Inspection 277/89-81, 278/89-81.

The inspector noted that the problems associated with Limitorque motor operated valve MO-38A torque switch settings were not addressed in this LER. The LER was reviewed and approved without comment at PORC meeting 89-28 on March 2, 1989. The inspector discussed this LER with the PORC Chairman. Licensee personnel indicated a revised LER will be submitted. This will be reviewed in a future inspection.

7.0 Surveillance Testing (61726, 71707)

The inspector observed surveillance tests to verify that testing had been properly scheduled, approved by shift supervision, control room operators were knowledgeable regarding testing in progress, approved procedures were being used, redundant systems or components were available for service as required, test instrumentation was calibrated, work was performed by qualified personnel, and test acceptance criteria were met. Daily surveillances including instrument channel checks were verified to be adequately performed. Parts of the following tests were observed:

- ST 9.32-2 and 3, Reactor Cold Shutdown Data Log, performed on both units during the period.

In addition, a review of the following completed surveillance tests was performed:

- ST 13.21, Emergency Cooling Water Pump, Fans and ESW Booster Pumps, performed in August 1988.
- ST 9.36, Inspection of Critical Electrical Panels, performed on Unit 2 in February/March 1989.

No inadequacies were identified.

8.0 Maintenance Activities (62703)

The inspectors reviewed administrative controls and associated documentation, and observed portions of work on the following maintenance activities:

<u>Document</u>	<u>Equipment</u>	<u>Date Observed</u>
MOD 5002	E-32 and E-22 bus relay modification	March 22 and 30, 1989
MOD R-188	ECCS pump room flood seals	March 23, 1989
MOD R-245	Nitrogen tubing support repairs	March 29, 1989

Administrative controls checked, if appropriate, included blocking permits, fire watches and ignition source controls, QA/QC involvement, radiological controls, plant conditions, Technical Specification LCOs, equipment alignment and turnover information, post maintenance testing and reportability. Documents reviewed, if appropriate, included maintenance procedures (M), maintenance request forms (MRF), item handling reports, radiation work permits (RWP), material certifications, and receipt inspections.

No inadequacies were identified.

9.0 Radiological Controls

9.1 Routine Observations (71707)

During the report period, the inspector examined work in progress in both units, including health physics procedures and controls, ALARA implementation, dosimetry and badging, protective clothing use, adherence to radiation work permit (RWP) requirements, radiation surveys, radiation protection instrument use, and handling of potentially contaminated equipment and materials.

The inspector observed individuals frisking in accordance with HP procedures. A sampling of high radiation area doors was verified to be locked as required. Compliance with RWP requirements was verified during each tour. RWP line entries were reviewed to verify that personnel had provided the required information and people working in RWP areas were observed to be meeting the applicable requirements. No unacceptable conditions were identified.

9.2 Health Physics (HP) Operational Training (83750)

The Integrated Assessment Team Inspection (NRC Inspection 277 and 278/89-81) identified areas of weakness in HP technician knowledge in federal exposure limits, technical specifications (TS) for high radiation control options, and gross alpha and beta maximum permissible concentrations (MPC) values. More significantly, the inspection identified that some contractor and PECO HP technicians hired subsequent to the shutdown lacked Peach Bottom operating power plant experience. The licensee committed to provide orientation and training in Peach Bottom power operations experience and radiological expectations.

The licensee developed lesson plans for performance objectives in NRC rules and regulations, procedures, and operational power plant orientation. The following topics were included:

- NRC rules and regulations, 10 CFR Parts 19 and 20
- TS 6.13, High Radiation Area control options
- Survey of incoming radioactive material
- MPC for alpha and beta, minimum air volumes for sampling, air sampling techniques
- Requirements for issuance of respiratory protective equipment
- Operational environmental concerns; noise, heat and atmosphere
- Coolant activity, steam and condensate
- Operational or power level exposure histories
- Wrong unit, wrong train errors
- Neutron survey methods
- Hot particle concerns

The training was given in seven classroom hours followed by a one hour examination. The examination was based on the performance objectives. Successful completion of the examination required a grade of 80% or better. The classroom training was followed by a 3 hour orientation tour of the plant led by an experienced health physics supervisor.

The inspector reviewed the lesson plans, attended the classroom training, and accompanied the students on the plant tour. The licensee chose to incorporate the training into a cycle of HP continuing training so that all of the operational HP technicians would receive the training. Training was essentially completed on March 29, 1989, except for two HP technicians who were scheduled on April 4, 1989, due to absences. The level of instruction was good. The plant orientation tour was effective. The instructor related his operational experience to the students by pointing out exposures levels at power in areas, stressed the need to understand the plant

operational condition and the power level to assess the radiological conditions, and indicated appropriate survey methods for areas based on past experience.

The inspector had no further questions. The restart commitment and related open item are closed (see section 3.10).

9.3 Control of Overtime (83750)

The inspector examined current and past control of overtime. The administrative control of overtime usage by health physics technicians (HPT) is governed by procedure A-40, revision 3, "Working Hours Restrictions". The procedure restricts HPTs to work less than 16 hours in a 24 hour period, 24 hours in 48 hour period, and 72 hours in seven day period. Deviations are allowed for unusual circumstances and are administratively controlled by requiring approval by two levels of HP supervision.

During the third quarter of 1988, the demand for HPT services was greatest due to the Unit 3 recirculation pipe replacement project activities. HPTs assigned to the project were regularly scheduled for 12 hours a day, five days a week. The average hours worked by HPTs were about 57 hours. Due to absences there were ten cases where the 72 hours during a seven day restriction was exceeded. In each case it was exceeded by less than two hours because of turnover time. For the HPTs in the balance of plant, Unit 2 and common areas, there were 13 times the overtime restrictions were exceeded. All of these cases were 24 hours in a 48 hour period criteria. These were due to absences of turnover personnel. All deviations were adequately documented.

Current practice limits the contractor HPTs to 40 hours a week and PECO HPTs to 60 hours a week. Staffing levels are deemed adequate to support restart with minimal utilization of overtime. The inspector had no further questions at this time.

10.0 Physical Security (71707)

10.1 Routine Observations

The inspector monitored security activities for compliance with the approved Security Plan and associated implementing procedures, including: security staffing, operations of the Central Alarm Station and Secondary Alarm Station, checks of vehicles to verify proper control, observation of protected area access control and badging procedures on each shift, inspection of protected and vital area barriers, checks on control of vital area access, escort procedures, checks of detection and assessment aids, and compensatory measures. No inadequacies were identified.

10.2 Training of Shift Security Assistants

A specialist security team inspection in January 1989 identified that the shift security assistants (SSA) should have a formal training program centered around performance objectives of a nuclear plant security program (see NRC Inspection 277 and 278/89-80). This training was to include such topics as NRC's regulations, policies and practices, and contingency event responses. The licensee committed to perform the training by February 18, 1989.

The licensee developed and implemented an enhancement training program for the SSAs which included an additional topic, the conduct of drills. By February 11, 1989, all of the SSAs had completed the training. The inspector verified that this training was completed. Selected SSAs were also interviewed regarding the training. No unacceptable conditions were noted. This restart item is considered closed.

11.0 Assurance of Quality (40500)

11.1 Management Involvement in Operations

Corporate and site management continue to be aggressively involved in Peach Bottom operational activities. For example, the Executive Vice President-Nuclear was noted as being present in the control room during day shift turnover and the 8:00 a.m. morning meeting on March 20, 1989. Also, the Peach Bottom Vice President and Plant Manager were observed on numerous occasions during the report period touring the control room and plant.

11.2 Quality of LERs

During the period, two LERs were noted as being deficient in that they had incomplete information (sections 5.4 and 6.2.3). LER 2-89-02 regarding the emergency cooling tower did not acknowledge that the Unit 2 system may have been inoperable. LER 2-89-03 did not address problems with the Limitorque motor operated valves torque switch settings. Both LERs were reviewed by PORC and approved by site management. However, those inadequacies were not identified by the licensee prior to submittal to the NRC.

11.3 Emergency Cooling Tower (ECT) Test

An area where assurance of quality was not demonstrated was in the maintenance and testing of the ECT system. By the end of the report period, the licensee's actions had not demonstrated system operability. Several weaknesses associated with ECT testing were noted. They include the following items:

- Changes to system operating procedures were not in place for the system test,
- System tests required numerous temporary changes to make equipment adequately operate,
- A planned integrated ECT system test was not done, and
- Equipment such as the ESW booster pump discharge valves were operated during the test in a manner that may not be consistent with the system design.

12.0 In-Office Review of Special Reports (71707)

The inspector reviewed the following:

- Annual Occupational Exposure Tabulation No. 13, January 1 to December 31, 1989, February 24, 1989.
- Peach Bottom Monthly Operating Report for January 1989, dated February 15, 1989.

No unacceptable conditions were noted.

13.0 NRC Bulletin No. 88-07, Supplement 1: Power Oscillations in Boiling Water Reactors (LaSalle Event) (25599)

During the Integrated Assessment Team Inspection (277 and 278/89-81) the NRC reviewed licensee actions in response to NRC Bulletin 88-07 and determined that licensee actions were not finalized. Adequate response to the NRC bulletin is required before plant restart. During this report period, the inspector reviewed facility documents as indicated in Attachment 3 to the inspection report, interviewed the shift technical advisor (STA), senior reactor operator and reactor operators to determine their knowledge of the procedures and the event at LaSalle that initiated the bulletin, and interviewed plant staff concerning training on the procedures. Training on the LaSalle event was also reviewed during the IATI.

The inspector concluded that startup, shutdown, single loop and recirculation pump trip procedures developed for Peach Bottom address the concerns of the bulletin with respect to power oscillations. The procedures avoid the oscillation region. If the defined oscillation region is entered, power is appropriately monitored for oscillation and actions are given to exit the region and to manually scram the reactor if oscillations exist. The inspector did have one human factor concern regarding procedure OT-112 "Recirculation Pump Trip". A note in the procedure that defines a power oscillation is located following the step in the procedure rather than preceding the step in the procedure. This is not consistent with licensee procedure writing instructions and will be corrected in the next procedure revision according to the licensee. The inspector noted that the licensee is also revising the off normal and operational transient

procedures to assure that during a fast shutdown condition the operators will not deliberately enter regions of potential power oscillations in response to the off normal conditions.

Based on discussions with the STA and operators, the inspector concluded that the operators understand the power oscillation event at LaSalle. The operators know that the procedures are being revised but have not received training on these procedure revisions. This is because the changes made to the procedures were recent. The licensee plans to have class room training completed by April 10, 1989 for the operators on the procedures that address power oscillation concerns. Bulletin 88-07 will remain open until the training for the operators has been completed.

14.0 Allegations

14.1 Whole Body Count and Quality Exit Interviews (88-RI-A-0118 and 0119) (71707, 83750)

Allegations were received concerning whole body count (WBC) practices and quality exit interviews when an employee is terminated. These workers were employees of a vendor. The allegeders contend that they were not advised to get a WBC nor were they paid sufficient time when their employment was terminated. In addition, they stated that they were not given opportunity to have a quality exit interview.

All workers with access to the radiologically controlled areas should have an initial WBC, be recounted regularly and be given an opportunity to receive an exit WBC when employment is terminated at the plant. The WBC is a bioassay method for determining uptake of radioactive material and is used to confirm the effectiveness of the respiratory protection program.

The inspector determined from pay records and time cards that each allegeder was paid an additional two hours to get a WBC after they were released from employment. The workers had been scheduled to be part of a reduction in force (RIF) on a Friday (December 2, 1988) after completing a job which was scheduled to begin Wednesday. Due to complications, the job could not be started for several days. A decision was made by vendor management to accelerate the RIF to Wednesday noon since no work could be done. The allegeders were aware of their responsibility to receive the WBC when they were released from the site. The allegeders were apparently advised to get the WBC by their supervisors and security personnel. The allegeders did not have an exit WBC performed.

For individuals who do not complete an exit WBC at time of their release, the licensee sends a letter requesting the individual to complete the WBC at their convenience. The licensee stated that

historical compliance with this letter has been good. The licensee sent a letter to the allegers. The licensee made reasonable attempts for the allegers to comply with the requirements of the exit WBC.

When the allegers were released from employment, there were no procedural requirements for workers to receive a quality exit concerns interview. The inspector noted that a new termination procedure, A112, revision 0, "Site Personnel Termination", was implemented on January 3, 1989. This procedure clarifies responsibilities and communication interfaces between health physics, security and the employing group when an individual is terminated. The procedure requires that each departing individual receive a copy of the quality concerns letter from the site Vice President. The letter explains the various methods a departing individual can communicate quality concerns to the management at the site, the corporate management, nuclear quality assurance, and government agencies. This information has been posted since the procedure was issued.

Allegations regarding failure to be given an opportunity to have an exit WBC and quality exit concerns interview performed are unsubstantiated. These allegations are closed.

14.2 Security Force Member Inattentiveness (RI-88-A-0118) (71707)

An alleger stated that he observed security force member (SFM) inattentiveness during the period from March to June 1988 while working on improvements to the security fence around the protected area. He noted that SFMs did not check lunch boxes, tools, equipment, or clothing being passed from one side of the fence to the other in the work area. He also observed that the SFMs were often talking to the workers or other SFMs thereby not observing their areas of responsibility. During this time frame several incidents of SFM inattentiveness occurred. These incidents and other problems with security led the licensee to replace the security force contractor in September 1988.

The licensee's oversight has been increased for the security force. The present security force contractor has improved the performance of the SFMs. A recent regional security team inspection noted improvement in SFMs performance (NRC Inspection 277 and 278/89-80).

The allegers observations were not specifically substantiated. Licensee corrective action for SFM inattentiveness has been successful. This allegation is closed.

14.3 Quality Control and Drilling Permits (RI-88-A-0119) (40500, 71707)

Two concerns were stated by the allegor. The first was an observation that quality control inspectors were signing off inspections at procedural hold points in pencil. The other concern was a personnel safety concern involving drilling in concrete walls without proper sign-off by the construction electrical supervisor.

On Maintenance Request Form (MRF) 8803529, the workers were required to drill six inch deep holes into concrete. While drilling the holes, workers encountered some obstructions in the concrete which could have been rebar, electrical conduit or aggregate. While the drilling was stopped to examine and evaluate the obstruction, the construction engineer discovered that the electrical construction engineer had not approved the drilling permit as specified in procedure CD 5.11, Revision 3, "Procedure for Performing Core Boring/Drilling at Peach Bottom." The construction engineer stopped the work. It was determined that the electrical lead man had reviewed the drilling request and examined the appropriate electrical drawings for embedded conduit. It was the responsibility of the site lead man, the craft supervisor, to ensure that the drilling permit was correctly approved. The procedure instructs the worker upon encountering obstructions to stop work until the obstruction is evaluated. In addition, the drill is equipped with a current interrupting device which stops the drill motor whenever rebar, conduit or any other grounded metal object is encountered.

The workers and the construction engineer took appropriate action to stop the work. Although the drilling permit lacked a proper authorization signature, a review had been made for embedded conduit, and controls were in place to prevent drilling into electrical conduit embedded in concrete. A nonconformance report was issued addressing the procedural nonconformance report (NCR) regarding the drilling permit.

The inspector found no evidence of QC inspectors using pencil for hold point signoffs. This is based on a review of selected QC records. The allegors concern that drilling into concrete was a personnel safety hazard was not substantiated. However, the licensee did identify (prior to review by the inspector) that a procedure signoff had not been performed. The appropriate reviews were performed prior to the drilling and adequate personnel safety precautions were in place during drilling operations. The licensee issued an NCR due to the missing signoff. NCR corrective actions were adequate. This item is closed.

14.4 Health Physics Program (RI-89-A-004) (71707, 83750)

The licensee received an allegation on December 29, 1988, concerning the health physics program. The licensee was informed of the allegation by management from another plant. They had received the allegation from a recently hired contract health physics technician (HPT). The licensee informed the Peach Bottom resident inspector of the allegation the following week. The licensee dispatched two corporate claims security investigators to the other plant site to interview the alleged to obtain details of the allegation.

Upon receipt of the alleged's written statement, the licensee determined the following items. The alleged had two concerns about events on the evening shift of August 26, 1988, during work activities in the drywell of Unit 3. The alleged contended that workers were in the drywell without being on a radiation work permit (RWP) and did not have health physics coverage. The drywell is a locked high radiation area which requires that all workers in the area must be on a RWP and be provided HP constant surveillance.

The licensee's investigation of the allegation included interviewing involved personnel, and reviewing the RWP and dose cards during the time in question. The licensee concluded from the statements and the evidence in the documents that the workers in the drywell of Unit 3 on the afternoon of August 26, 1988, were documented to be on an RWP, and there was an HPT in constant surveillance when workers were in the drywell.

The inspector reviewed the licensee's investigation report and supporting documentation. The inspector reviewed the licensee's conclusion to the investigation. Selected licensee HPTs and supervisory personnel were interviewed by the inspector. No unacceptable conditions were noted.

The allegation is unsubstantiated and is closed.

15.0 Management Meetings

15.1 Preliminary Inspection Findings (30703)

A verbal summary of preliminary findings was provided to the Manager, Peach Bottom Station at the conclusion of the inspection. During the inspection, licensee management was periodically notified verbally of the preliminary findings by the resident inspectors. No written inspection material was provided to the licensee during the inspection. No proprietary information is included in this report.

15.2 Attendance at Management Meetings Conducted by Region Based Inspectors (30703)

<u>Date</u>	<u>Subject</u>	<u>Inspection Report No.</u>	<u>Reporting Inspector</u>
2/27- 3/7/89	Open Items	89-06/06	Golla
3/8-10/89	Health Physics	89-09/09	Dragoun
3/21/89	RO Exam - Plant Walkaround	89-10	Florek

15.3 Local Public Meetings on February 28 and March 1, 1989 (94703)

The inspector attended local public meetings to discuss the Peach Bottom shutdown status and to receive public comments relating to restart. These meetings were held as follows:

- Harford County Council Chambers, Bel Air, MD, on February 28, 1989.
- Solanco High School, Quarryville, Lancaster County, PA on February 28, 1989.
- Kennard-Dale High School, Fawn Grove, York County, PA, on March 1, 1989.

These meetings were transcribed by a court reporter and the transcripts were made available at local libraries.

15.4 ACRS Meetings March 8 and 9, 1989 (94702)

The inspector attended an ACRS subcommittee meeting on March 8, 1989, and the ACRS full committee meeting on March 9, 1989. At these meetings, the NRC staff and the licensee made presentations and responded to questions regarding Peach Bottom restart.

15.5 NRC Commissioner Visits (94702, 94703)

On March 14, 1989, NRC Chairman Lando Zech and the Regional Administrator, William Russell, toured the Peach Bottom facility. The Chairman held a press conference at the Peach Bottom Conference Center.

On March 27, 1989, NRC Commissioner James Curtiss toured the Peach Bottom facility.

The inspector accompanied the tour.

PEACH BOTTOM
UNIT 2

ASSESSMENT
OF
ADEQUACY

PIPING SYSTEM
SUPPORTS

2/15/89

PG1

GENERAL CONCLUSIONS

- NO ITEMS OF MAJOR SAFETY SIGNIFICANCE WERE DISCOVERED
- 10% OF SMALL PIPING (ORIG. EST.) ON UNIT 2 WAS WALKED-DOWN IN DETAIL AND EVALUATED
- 100% SMALL PIPING WILL BE SHOWN CAPABLE OF PERFORMING ITS DESIGN FUNCTION (99+% CONFIDENCE)
- 10% SMALL LINES (UPPER BOUND) PROJECTED TO EXCEED STRESS LIMITS OF LICENSE COMMITMENT (95% CONFIDENCE)
- A GENERIC CONDITION INVOLVING SEAL WELDED DRAIN LINES WAS IDENTIFIED AND RECTIFIED
- MANY "HANGER ISO'S" FOR 2" AND UNDER PIPE DO NOT ACCURATLY REFLECT FIELD CONDITIONS
- MOST ANOMALIES WERE THE RESULT OF ORIGINAL CONSTRUCTION

BACKGROUND

- PRE-MOD WALKDOWN ON UNIT 2 ESW IDENTIFIED MANY DEFICIENT SUPPORTS
- AN ASSESSMENT PROGRAM WAS INITIATED FOR OTHER SAFETY SYSTEMS TO ASSESS EXTENT OF CONCERN
- APPROACH: WALK-DOWN AND EVALUATE A SAMPLE
- FOCUS: 3" AND SMALLER Q-PIPE
- CONFIDENCE LEVEL IN LARGER PIPE BASED ON:
 - RECENT MAJOR MODS
 - ISI PROGRAM
 - 79-02 AND 79-14 PROGRAMS

BACKGROUND (CON'T)

- "SMART" SAMPLE OF 3" AND SMALLER Q PIPE WALKED DOWN
- CONSERVATIVE BIAS BASED ON:
 - HIGH TEMP/PRESSURE
 - CONCENTRATED WEIGHTS
 - Q/NON-Q INTERFACE
- 50 OF 500 PACKAGES OR 5000 FT OF 50000 FT (ORIG. EST.) MIL. STD 105D LEVEL II
- TOTALS BASED ON LIMERICK COMMODITY REPORTS
- APPROX. 500 DESCREPANCIES
- TASK: ENGINEERING ASSESSMENT OF THE IMPACT
- GOAL: DEMONSTRATE THAT LICENSE COMMITMENT WAS MAINTAINED
- PRELIMINARY RESULTS PRESENTED TO NRC ON 9/7/88 (NO UNACCEPTABLE CONDITIONS FOUND UP TO THAT TIME)

ENGINEERING EVALUATION

- ENGINEERING JUDGEMENT WAS USED TO SELECT THOSE LINES MOST LIKELY TO HAVE SIGNIFICANT DEFICIENCIES
- 24 DETAILED ANALYSES WERE EVENTUALLY PERFORMED FOR THE ORIGINAL PROGRAM
- THE ANALYSES REMOVED CONSERVATISMS TO DEMONSTRATE ACCEPTABILITY
- 2 1/2" AND 3" WERE ALL FOUND ACCEPTABLE
- 3 PACKAGES WERE DETERMINED TO HAVE STRESSES IN EXCESS OF THE LICENSE COMMITMENT, i.e. ANSI B31.1 OR ASME SECTION III USING LOAD COMBINATIONS OF FSAR APPX. A

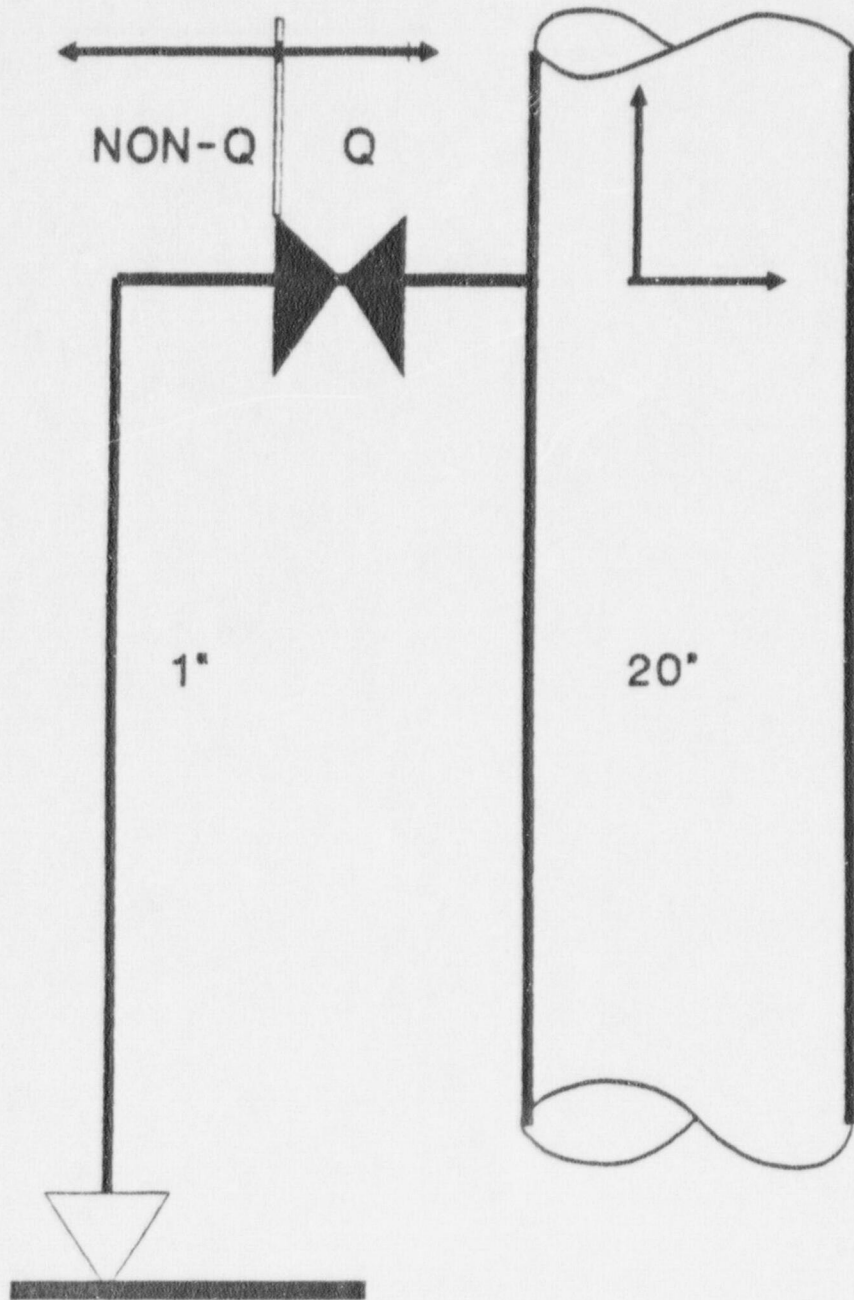
ENG. EVALUATION (CON'T)

- OF THE 3 ORIGINAL PACKAGES DETERMINED TO HAVE EXCESSIVE STRESSES:
 - TWO WERE UNIQUE
 - ONE WAS GENERIC
- THE UNIQUE CONDITIONS INVOLVED SPECIFIC OVERSITES IN DESIGN OR CONSTRUCTION
- THE GENERIC CONDITION INVOLVED ECCS DRAIN LINES WELDED TO THEIR FUNNELS WITH NO CONSIDERATION OF PIPE MOVEMENT
 - THIS WAS AN ORIGINAL PLANT CONDITION

ACTIONS TAKEN

- ALL KNOWN SIGNIFICANT DISCREPANCIES REPAIRED
- FUNCTIONAL ABILITY DEMONSTRATION OF OVERSTRESSED LINES
- PROGRAM EXTENDED FOR WELDED-IN DRAINS
- COMMITMENT TO DEVELOP LONG TERM PROGRAM FOR BALANCE OF SMALL PIPE IN CONJUNCTION WITH CONFIGURATION MANAGEMENT PROGRAM

TYPICAL DRAIN LINE



2/15/89

PG8

ACTIONS TAKEN FOR DRAINS

- APPROX. 60% OF ECCS DRAINS WERE IDENTIFIED AND EVALUATED (ALL HPCI AND RCIC, 2 OF 4 RHR, AND 2 OF 4 CORE SPRAY)
- 22 FUNNELS WITH 63 DRAIN LINES WERE EVALUATED
- 16 DRAINS EVALUATED IN DETAIL
- 1 ADDITIONAL DRAIN LINE FOUND WITH EXCESSIVE PIPE STRESS
- BOTH OVERSTRESSED LINES WERE RHR S/D COOLING SUCTION
- THE REMAINING 2 S/D COOLING LINES WERE ANALYSED AND FOUND ACCEPTABLE
- BOTH OVERSTRESSED LINES HAVE BEEN REPAIRED
- OTHER SUPPORTS HAVE BEEN MODIFIED TO IMPROVE STRESSES
- ALL SIGNIFICANT CONCERNS FOR WELDED-IN DRAIN LINES HAVE BEEN ADDRESSED AND RESOLVED

FUNCTIONALITY

- THE ABILITY OF OVER-STRESSED LINES TO PERFORM THEIR REQUIRED SAFETY FUNCTION IS DEMONSTRATED BY
 - ANALYSIS
 - OPERATING EXPERIENCE
 - NDE OF OVERSTRESSED PIPE

FUNCTION (CON'T)

- THE 2 DRAIN LINES WHICH WERE OVERSTRESSED WERE DUE TO THERMAL LOADS
-ACCEPTABILITY DEMONSTRATION BASED ON:
 - *OPERATING EXPERIENCE WITH NO FAILURE
 - *NDE OF OVERSTRESSED PIPE
 - *ACCEPTABILITY OF STRESS ANALYSIS IN THE FAULTED CONDITION

FUNCTION (CON'T)

- THE 2 NON-DRAIN OVER-STRESSED LOAD CONDITIONS WERE SEISMIC AND THERMAL -THESE CONDITIONS ARE ANALYSED USING ITERATIVE FINITE ELEMENT ANALYSIS CONSIDERING :
 - STRAIN LIMITS
 - ELASTIC-PLASTIC ANALYSIS (INCLUDING WORK HARDENING)
 - BI-LINEAR SUPPORT MODELINGAND ARE BEING SHOWN TO MAINTAIN THEIR INTEGRITY AND FUNCTION

SUMMARY OF STATISTICAL ANALYSIS

- THE SAMPLE SIZE OF 50 WAS CONSIDERED TO BE AN ACHIEVABLE SAMPLE, CONSISTENT WITH THE STANDARD SAMPLING TECHNIQUE MIL. SPEC. 105D, INSP. LEVEL II
- THE FACT THAT ALL SMALL PIPING DEMONSTRATES FUNCTIONALITY PROVIDES A CONFIDENCE LEVEL OF 99%+ THAT 100% OF THE PIPING WILL PERFORM ITS DESIGN FUNCTION

STAT. SUMMARY (CONT.)

- THE "UNIVERSE" SIZE WAS BASED ON AN ASSESSMENT OF LIMERICK COMMODITIES
- COMPARABLE LGS PIPING (ORIG. EST.) IS 50,000 FT WITH AN AVG. CALC. SIZE OF 100FT
- THE PEACH BOTTOM MODEL WAS REFINED AFTER THE WALK-DOWN TO 36,000 FT INCLUDING ONLY 2" AND UNDER PIPE. THE AVG. LENGTH OF THE LINES SURVEYED WAS 55 FT.
- THIS MODEL PROVIDES A 95% CONFIDENCE LEVEL THAT 90% OF THE PEACH BOTTOM SMALL PIPE MEETS THE LICENSE COMMITMENT

COST AND SCHEDULE

- THE ORIGINAL SCOPE PROGRAM IS COMPLETE FOR UNIT 2
- A REDUCED SCOPE UNIT 3 PROGRAM WHICH WAS INTERRUPTED BY THE DRAIN PROGRAM WILL BE COMPLETED BY 5/8/89
- THE ESTIMATED EFFORT FOR THE ORIGINAL SCOPE WAS 22,000 M-H
- THE DRAIN PROGRAM BEGAN IN LATE NOVEMBER AND IS COMPLETE
- THE COST OF THE DRAIN PROGRAM WAS 8,000 M-H
- FUNCTIONALITY ANALYSIS TO BE COMPLETE IN LATE FEB. PRELIMINARY RESULTS INDICATE THAT THE SYSTEMS WILL BE SHOWN TO BE FUNCTIONAL

ATTACHMENT 2
EMERGENCY COOLING TOWER HISTORICAL TESTING

<u>Parameter</u>	<u>Startup Test #95</u> Note 1	<u>SP-630 (1983)</u> Note 2	<u>SP-630 (1988)</u> Note 3	<u>SP-630-2 (1989)</u> Note 4
Unit 2 (U/2) & Unit 3 (U/3) components and flow path tested	No	Yes	No	No
Level control test	U/2	Both letdown lines tested at same time	U/3	U/2
Heat loads included	No	Yes	No	No
Unit flow paths	U/2	U/2 and U/3	U/2	U/2
ESW pump(s) tested	A	A for 5 hrs or 2 hrs stable operation	B	A
HPSW pumps tested	U/2	U/2 and U/3	U/3	U/2
ECW pump tested	Yes	Yes	Yes	Yes (Omitted)
ECT fans tested	Yes	Yes	Yes	No (Inoperable)
ESW Booster Pumps tested	Yes (tripping)	Yes	Yes (tripping)	Yes (Throttled)

Notes:

1. Test was a pre-operational test and not an integrated system test. Problems were identified with venting the pump bay structure and ESW booster pump tripping. These problems were not corrected. The test established 17,000 gpm flow through the Unit 2 letdown line.
2. RBCCW was crosstied to fuel pool cooling (service water side) to provide heat load. Silty water into RBCCW from service water damaged both Unit 2 RBCCW pump seals and the test was stopped before ECT and ECW system operation.
3. Test was stopped because of level control and ESW booster pump problems. An engineering evaluation after the test concluded that the ECW/ESW was not operable. Problems were identified with the pump bay, level control operation and calibration, ESW booster pump operation, lack of seismically

qualified power supplies, system lineups, and ability of pump structure to withstand the forces of the design flood. The licensee is addressing these problems. ISEG evaluation (PB-88-10 Supp. 1) of this test recommended an integrated test of the ECT and ECW system should be developed and performed to demonstrate that all flow paths, including both HPSW pump bay paths, are capable of performing their design function.

4. Test was considered a "partial" test. The ECW pump loop was not tested. The ECT fans were inoperable, and therefore were not tested.

ATTACHMENT 3
DOCUMENTS REVIEWED

RE-31, Reactor Engineering Startup/Load Drop Instructions, Revision 3 dated 2/28/89.

OT-112, Recirculation Pump Trip Procedure, Revision 7 dated 3/18/89.

ST-3.3.2A, Calibration of APRM System and Thermal Limit Check for Single Loop Operations, Revision 6 dated 11/18/88.

S.2.3.1.J-SL, Single Loop Operation with one Recirculation Pump Out of Service, Revision 3 dated 3/20/89.

GP-3, Normal Plant Shutdown, Revision 40 dated 3/20/89.

GP-9-2, Fast Power Reduction, Revision 5 dated 3/17/89.

ST-3.10A, Core Stability Monitoring/Baseline Data Acquisition, Revision 1 dated 3/1/89.

ST-3.10B, Core Stability Monitoring, Revision 0 dated 3/20/89.

OT-100, Reactor Low Level, Revision 2 PORC review 3/20/89.

OT-102, Reactor High Pressure, Revision 1.

OT-103, Main Steamline High Radiation, Revision 1 PORC review 3/20/89.

OT-104, Positive Reactivity Insertion, Revision 0 dated 3/18/89

OT-106, Condenser Low Vacuum, Revision 3 draft.

ON-101, Loss of Isolated Phase Bus Cooling, Revision 1 dated 3/18/89.

ON-113, Loss of RBCCW, Revision 2 draft.

Letter dated March 7, 1989, J. Gallagher (PECO) to USNRC Limerick Generating Station, Units 1 and 2, Peach Bottom Atomic Power Station, Units 2 and 3 Response to NRC Bulletin No. 88-07, Supplement 1: "Power Oscillations in Boiling Water Reactors"