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REGION 1

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LICENSEE: Philadelphia Electric Company

FACILITY NAME: Peach Bottom Atomic Power Station Units 2&3

INSPECTION AT: Delta, Pennsylvania

INSPECTION DATES: August 26-28, 1992 and September 14-19, 1992

INSPECTOR: *R. A. McBrearty for RIM* 9-29-92
R. A. McBrearty, Reactor Engineer, Date
Materials Section, EB, DRS

APPROVED BY: *E. Harold Gray for RHB* 9-29-92
E. Harold Gray, Chief, Materials Section, Date
Engineering Branch, DRS

Inspection Summary: An inspection was conducted of the licensee's inservice inspection program and related activities to ascertain that the program conformed to applicable code and regulatory requirements, and that the activities were performed in a way that confirmed the plant's acceptability to safely return to service. Particular emphasis was placed on the licensee's process for selecting its examination sample of reactor water cleanup (RWCU) system welds located outside of containment and susceptible to intergranular stress corrosion cracking (IGSCC).

Results: Inservice examinations are performed by qualified individuals with oversight by the licensee's quality assurance organization. The selection process for establishing the RWCU weld examination sample was based on a survey of 100% of the weld population and included welds which were determined to have a high susceptibility to IGSCC. The sample size was greater than the minimum suggested by the supplement to Generic Letter 88-01 which provided the NRC staff position on that subject.

1.0 INSERVICE INSPECTION (ISI) PROGRAM (Inspection Procedure (IP) 73051)

A nuclear generating facility depends on numerous systems and components for the safe operation and shutdown of the facility. To assure that those systems and components will operate when required, the NRC mandates that each facility establish an inservice inspection program. Specific inspection requirements regarding method and frequency of examinations are contained in the ASME Boiler and Pressure Vessel Code, Section XI. Because it confirms the structural integrity of the reactor coolant system and other piping systems, inservice inspection is essential to protect public health and safety.

Peach Bottom Units 2&3 are in the second 10-year inspection interval and are committed to comply with the ASME Code, Section XI, 1980 Edition through winter 1981 Addenda. The Unit 2 interval commenced on September 19, 1986 and the Unit 3 interval commenced on December 23, 1985. The Unit 2&3 intervals are scheduled to end on July 5, 1994 and December 23, 1994, respectively. The original start and end dates were changed to those identified above to accommodate refueling outage alignment and the extended shutdown experienced by the plants. Details are documented in the licensee letter dated, February 25, 1991.

Specification No. M-733, Revision 0, "Nuclear Safety-Related Specification for Peach Bottom Atomic Power Station Units 2&3 Inservice Inspection Program Second Interval," was issued for use on July 3, 1990 and describes the inservice inspection program and seven augmented programs for each unit. The augmented programs include those related to Generic Letter 88-01, NUREG-0619 and NRC Bulletin 80-13 regarding intergranular stress corrosion cracking (IGSC) and cracking in core spray spargers, respectively. The remaining augmented programs deal with the snubber examination and test program, General Electric Company (GE) Information Letters, NUREG/CR 3052 and NRC Bulletin 80-07.

An inspectability study regarding the accessibility of the Peach Bottom Unit 3 reactor pressure vessel (RPV) seam welds for an ultrasonic examination was performed in 1992 by the General Electric Company for the licensee. The study was performed to determine the accessibility of the RPV welds for ultrasonic examination using the GE computer controlled GERIS-2000 automated system. The results of the study indicate that a high percentage of the vessel welds can be ultrasonically examined using the GE system. A similar study of Unit 2 welds was performed by GE in 1991. Exact percentages will not be available until the examinations are performed.

The scheduling of examinations identified in the 10-year program plan for completion during the current refueling outage was inspected to ascertain that ASME Code requirements are complied with and that documentation is available to confirm that the examinations are scheduled at the appropriate time. The inspection was performed by verifying a selected sample of welds in the Class 1 recirculation system and in a portion of the Class 2 residual heat removal (RHR) system.

Action Request (A/R) No. A0374990 dated March 24, 1992, was initiated to request the performance of inservice inspection during Unit 2 refueling outage No. 9 (2R09) in accordance with the 1992 Unit 2 ISI outage plan and ISI program (Specification M-733). The A/R resulted in 37 work orders which identified all of the items scheduled for inservice examination during 2R09, the current refueling outage.

The appropriate work orders for the selected systems were obtained using the PIMS computer database and the identified welds were compared with the 10-year plan. With the exception of the recirculation system safe-end to nozzle N2A weld 2BHA-8 examination, which was deferred until the last inspection period of the 10-year interval, all of the required welds were listed for examination during the present outage. The work orders listed the specific welds and the particular NDE method as identified by the 10-year plan. The deferred examination was clearly documented in the outage plan and will be included in the 10-year plan when the plan is updated at the end of the outage. The plan is maintained in the ISIC computer database which is used to track the status of examinations which are included in the 10-year plan.

Conclusion

The licensee has an established system for planning and scheduling examinations, and for tracking the status of its inservice inspection program which provides assurance that all required examinations are performed or are accounted for. The outage schedule of examinations was determined to be accurate and the deferral of a scheduled examination was clearly documented.

2.0 REVIEW OF INSERVICE INSPECTION IMPLEMENTING PROCEDURES (IP 73052)

Selected ISI vendor nondestructive examination procedures were reviewed to ascertain that the procedures complied with applicable code and regulatory requirements, and that the procedures were approved for use at the Peach Bottom facility. The following were included in the inspection:

- Procedure No. UT-PE-002, revision 7, "Manual Ultrasonic Examination of Similar and Dissimilar Metal Welds in Piping Systems"
- Procedure No. UT-PE-002, Supplement 2, Revision 3, "Supplement for Manual Ultrasonic Examination of Dissimilar Metal Welds and Weld Butter Materials"
- Procedure No. UT-PE, Evaluation, Revision 2, "Evaluation of Ultrasonic Examination Data"

- Procedure No. LP-PE-001, Revision 3, "Liquid Penetrant Examination Procedure"
- Procedure No. MT-PE-001, Revision 1, "Magnetic Particle Examination Procedure"

The above listed procedures were prepared by the licensee's ISI vendor, GE, and have been incorporated into the licensee's program. Each procedure has been reviewed by the PECO Level III and is approved for use at Peach Bottom. Procedure UT-PE-002 and its supplement govern examinations for the detection of intergranular stress corrosion cracking (IGSCC). Included in the procedure is the requirement that examination personnel have certification for the detection of IGSCC from the EPRI NDE Center as required by the NRC/EPRI/BWROG Coordination Plan for Training and Qualification of NDE Personnel.

Conclusion

The GE prepared NDE procedures have been reviewed and approved by PECO for incorporation into the licensee's ISI program for use at Peach Bottom. They are clearly written, comprehensive and are appropriate for their intended function.

3.0 INSERVICE INSPECTION ACTIVITIES (IPs 73753 and 73755)

Reactor water cleanup (RWCU) system welds located outside of containment were selected by the licensee for examination based on guidance contained in Generic Letter (GL) 88-01 and its supplement dated February 4, 1992. The supplement provides the NRC staff position that an inspection of the IGSCC susceptible RWCU piping welds on a sampling basis of at least 10% of the weld population should be performed during each refueling outage. The licensee committed to perform an inspection of 10% of the RWCU weld population during 2R09 and 3R09, the next refueling outage at each unit after August 17, 1992, the date of the commitment. The total population of RWCU welds outside of containment was determined to be 110 welds so that 11 welds had to be examined. The licensee selected an inspection sample of 12 welds.

Inspection sample selection was based on a survey of radiographs and construction records of the total weld population. Based on the survey results, welds were categorized as having high or low susceptibility to IGSCC. Two inspection samples were chosen, each containing a mixture of high and low susceptible welds with 100% of the high susceptible welds accounted for in the two samples. The sample selection process was discussed with NRR prior to performance of the inspections.

The licensee planned to ultrasonically examine one of the samples and if problems were identified to perform an ultrasonic examination of the second expansion sample. Results of the examination were selected for inspection to ascertain that the weld examinations were performed in compliance with licensee commitments and regulatory requirements. Data associated with the following welds were included in the inspection:

- Weld No. 12-7-4, 4" diameter tee to pipe weld
- Weld No. 12-7-3, 4" diameter pipe to tee weld
- Weld No. 12-4-4, 6" diameter tee to pipe weld
- Weld No. 12-4-2, 6" diameter pipe to tee weld
- Weld No. 12-10-2, 4" diameter elbow to pipe weld
- Weld No. 12-10-10, 4" diameter pipe to elbow weld
- Weld No. 12-7-2, 4" diameter tee to pipe weld
- Weld No. 12-7-7, 4" diameter pipe to flange weld
- Weld No. 12-8-1, 4" diameter elbow to pipe weld
- Weld No. 12-13-1, 4" diameter pipe to elbow weld
- Weld No. 12-8-24, 4" diameter elbow to pipe weld

The examination results showed that no evidence of IGSCC was detected, no recordable indications were detected and therefore, welds were acceptable for continued service and no additional welds (second sample) required examination. Licensee control of the data was evidenced by signature of its Level III examiner who reviewed each data sheet.

The inspector witnessed the calibration of the ultrasonic equipment used to perform the examination of the above listed 4" diameter welds. As part of the calibration process, the technician verified the sound exit point and the refracted angle of the transducer. Documentation and drawings were available to verify the significant calibration block attributes of the 4" diameter and 6" diameter calibration blocks used for the RWCU system weld examinations. Additionally, qualification/certification records of vendor NDE personnel responsible for performing the ultrasonic examinations of the RWCU welds were inspected to confirm that the individuals were properly qualified and certified. The inspector determined that the technicians were certified to the appropriate SNT-TC-1A level of competence commensurate with their assigned duties. The appropriate examiners were also listed on the latest EPRI Registry of Certified Personnel for UT of IGSCC as required by NUREG-0313, Revision 2 and Generic Letter 88-01.

Quality assurance oversight of ISI vendor activities is performed by the NDE Support Section of the licensee's Nuclear Quality Assurance Department. The NDE support section memorandum, dated August 25, 1992, describes the actions planned by the section which include:

- Review and approve all vendor NDE procedures.
- Review and approve all NDE personnel certifications.
- Witness or independently re-examine 10% of planned ISI and erosion/corrosion examinations.
- Review and approve all examination data generated by the vendor in the performance of ISI.

The review and approval of procedures and personnel certification records has been completed and was verified by the inspector. The data review process is on-going and has been verified by the inspector with respect to the RWCU welds discussed above.

Conclusion

The method established by the licensee to select the inspection sample of RWCU system piping welds outside of containment was designed to provide a high degree of confidence in the acceptability of the system by including the welds which were determined to be the most susceptible to intergranular stress corrosion cracking. The examination data were complete and clearly documented the acceptability of the welds for continued service.

The licensee's plans for quality assurance oversight of its ISI contractor are comprehensive and are being implemented by qualified individuals.

4.0 Exit Meeting

The inspector met with licensee representatives at the conclusion of the inspection on September 18, 1992, which is denoted in Attachment 1. The inspector summarized the scope and findings of the inspection.

ATTACHMENT 1

PERSONS CONTACTED

Philadelphia Electric Company (PECo)

H. Abendroth, Atlantic Electric
S. Baker, NQA, PBQV
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