UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

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Report Nos. 50-553/80-10 and 50-554/80-09

Licensee: Tennessee Valley Authority
500A Chestnut Street
Chattanooga, TN 37401

Facility Name: Phipps Bend Nuclear Plant

Docket Nos. 50-553 and 50-554

License Nos. CPPR-162 and CPPR-163

Inspection at Pickel Island near Knoxville, Tennessee and Phipps Bend site near Kingsport, Tennessee

Inspector: R W Wright — 7/21/80
R. W. Wright — Date Signed

Approved by: F. S. Cantrell — 7/21/80
F. S. Cantrell, Section Chief, RCES Branch — Date Signed

SUMMARY

Inspection on June 23-27, 1980

Areas Inspected

This routine, unannounced inspection involved 37 inspector-hours at Pickel Island and on site in the areas of licensee action on previous inspection findings; VSL heavy lifting and transporting activities; construction status; QA/QC organization changes; licensee identified items; inspector followup items; and status of IEB's.

Results

Of the seven areas inspected, no items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Licensee Employees

W. P. Kelleghan, Project Manager
*G. W. Wadewitz, Construction Engineer
*J. C. Coefield, Assistant Construction Engineer, Project Engineering
*T. V. Abbatiello, Assistant Construction Engineer, Quality Control
*W. K. Anders, OEDC, QA Staff
*D. E. Hitchock, Site QA Supervisor
*S. R. Stout, Licensing Engineer, ENDES
*T. Parrish, Licensing Engineer, ENDES
*H. B. McCracken, Mechanical Engineer, TSU
J. E. Rose, Supervisor, Welding Engineering Unit, PE
W. K Burner, Supervisor Welding QC Unit
J. Mauro, Mechanical Engineer, VSL Site Coordinator, TSU
J. Fifrick, Site QA Engineer
M. Alva, Site QA Engineer
T. Bowles, Construction Services Branch, Knoxville
J. A. Crittenden, Supervisor, Electrical QC Unit
J. Parrish, Supervisor, Electrical Engineering Unit, PE
C. Wise, Mechanical Engineer, MEU, PE

Other licensee employees contacted included construction craftsmen, technicians, QC inspectors, and office personnel.

Other Organizations

K. Bidder, Division Manager, VSL Corp., Heavy Lifting and Transportation (VSL)
J. McCarthy, Superintendent, VSL
R. McCrossen, Field Quality Assurance Manager, VSL
A. G. Bishop, General Electric Company Field Representative
L. Jindra, C. F. Braun Site Engineer

*Attended exit interview

2. Exit Interivew

The inspection scope and findings were summarized on June 27, 1980, with those persons indicated in Paragraph 1 above. The licensee was advised that no new items of noncompliance or deviations were identified by the inspector.

3. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item 553-554/80-01-01: RIS&PM implementation for HPCS diesel generator and RCIC turbine. RII inspection reports 553/80-06 and 554/80-05 left this item open because QCIR 20584, "RCIC turbine preparation for storage function" was not complete. Since the above RII inspection,

mechanical engineering unit has dispositioned the subject QCIR by requiring preventive maintenance to be accomplished on the mechanical portions of the subject steam turbine in accordance with Terry Corporation Specification No. SP-11. Examination of preparation for storage inspection records and preventive maintenance records revealed these activities have been implemented for the RCIC turbine. The subject QCIR remains in a hold status until the licensee receives electrical (NEMA) specifications for megging the associated D. C. motor which is to be accomplished on an annual basis.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Independent Inspection Effort

The inspector conducted a general inspection of the construction status and work activities underway in Unit 1 and 2 spray ponds; in containment, auxiliary and fuel building areas for both units. Anticipated construction schedules for various projected inspection modules were inquired about.

Within the above areas of independent inspection no deviations or items of noncompliance were identified.

6. VSL Corporation Heavy Lifting & Transporting Activities

a. General

On June 23, 1980, the RII inspector arrived at the unloading dock being used by VSL located near Pickle Island outside of Knoxville, Tennessee. Unit 1's reactor pressure vessel (RPV) had already been lifted and positioned on VSL's multiwheeled transporter which was parked on the sunken barge. The RPV shroud head with steam separators had not been moved from its barge and the two drywell heads were still stored aboard a second barge. The RPV head had been off loaded and placed on its overland transporter. TVA site QA/QC surveillance and audit personnel along with a representative from their Knoxville Construction Services Branch were found present at the dock. Discussions revealed the State Department of Transportation had required that all of the above items had to travel its highways as one unit or convoy. That afternoon the RII inspector proceeded to the Phipps Bend site by traversing portions of the proposed RPV convoy overland route and examined the docking facilities to be employed by VSL at Mossy Creek and Malinda Bridge.

On June 27, 1980, the RII inspector returned to Pickel Island to check the progress of the unloading activities. The RPV had been moved off the barge to a convoy staging area up the hill. The RPV shroud and separator assembly was found mounted on a low-boy trailer in the staging area. Discussion with TVA's - VSL site coordinator revealed the assembly had been hosed down again when off-loaded from the barge

with demineralized water containing a minimum of 500 ppm phosphate (TSP inhibited water) and was to be wrapped in polyethylene and tarpaulins for protection against the elements prior to transporting. One drywell head was lifted that morning and placed on an overload transporter. The second drywell head was still resting on the barge.

b. Procedure Review & Documentation Review

The RII inspector examined the following VSL procedures which were approved by the licensee: PB-1 through PB-34 inclusive, with the exception of PB-6, 11, and 22.

VSL's completed QC checklists for activities described by VSL procedures PB-1, 2, 8, 15, 17, 18, 21, 25, 26, 29, 30, 31, 32 and 34 were reviewed.

c. Reactor Pressure Vessel (RPV)

TVA RIS&PM QC personnel were observed monitoring and changing nitrogen bottles that are supplying a purge to the vessel in accordance with RIS&PM procedure M-650 Rev. 1. Records examined (Reactor Pressure Vessel T-60) for the period May 15 to June 23, 1980, verified that daily inspection of the nitrogen purge had been accomplished. Two relatively minor TVA initiated QCIR's No. 20508 pertaining to a hydraulic oil spill from an overhoad jack and QCIR No. 20506 for possible slight damage that occurred to a protective cover during lifting operations were noted attached to the RPV.

d. RPV Shroud Head and Separators

The licensee notified RII that on June 12, 1980, the steam separator assembly was engulfed in smoke and flames when polyethylene wrapping, canvas tarpaulin and its wooden shipping crate caught fire and burned aboard the barge while awaiting to be unloaded at the dock near Knoxville, Tennessee. The apparent cause of the fire was an air-arc gouging operation being used to remove lugs in contact with the shipping crate. The fire department extinguished the blaze with chorinated city water. The assembly was thorougly hosed down with high pressure demineralized water on June 18 and 19 to remove as much foreign material and debris as possible. This clean up operation was performed with demineralized water that met the requirements of GE specification 21A2045 Rev. 2. Upon examination the RII inspector noted that visible damage to the assembly includes discoloration of the stainless steel due to smoke and burning haze and the adhering of melted polythelene to the surface of the steam separators. Discussions with TVA QA/QC personnel revealed that some metal etching had been performed and test coupons were taken from a few of the steam separators for metallurgical evaluation. Present plans are to ship the subject shroud and steam separator assembly along with the RPV to the Phipps Bend site and there conduct cleanup operations in accordance with GE field deviation disposition request FDDR No. LG5-030, Rev. 1. If required by metallurgical evaluation of specimens; to replace affected steam separators. Future resolution of this problem will be handled under LII item 553/80-10-09.

Within the above VSL areas of inspection no deviations or items of noncompliance were identified.

7. Welding Unit Reorganization

As described in Construction Engineering Procedure CEP 1.01, Rev. 5, Phipps Bend welding responsibilities are now divided between Project Engineering and Quality Control. TVA is conducting an approximate six month study of the benefits to be derived by separating into a site welding engineering unit and a welding QC unit. A management evaluation of the findings will follow the study. The welding engineering unit will be responsible for interpretation of code and specification requirements; the development of welding procedures, erection and welding sequences on weldments and weld features; qualification of welding procedures; specifying of welding and inspection procedures; documentation requirements, and post weld heat treatment and other metallurgical treatments. The welding QC unit will handle welding inspections; code documentation and the certification of welders.

8. Licensee Identified Items (LII)

Prior to this inspection the licensee identified several items which were considered potentially reportable under 10 CFR 50.55(e). The items are as follows:

a. (Open) Item 553/79-15-01, 554/79-14-01: High pressure core spray diesel generator control switchgear wiring discrepancies (NCR PNB-033). RII received the licensee's fourth interim report dated April 25, 1980. Discussions with TVA's electrical QC personnel revealed little progress has been made since that last reported in RII inspection report 50-553/80-06 and 50-554/80-05. Replacement parts described in the above reports along with offical revised drawings have not been received at the Phipps Bend site to date. The licensee expects to submit its next report on this deficiency by June 30, 1980.

b. (Closed) Item 553/79-15-02, 554/79-14-02: Nelson studs for embedments in reactor building bent beyond specification tolerances (NCR PBN-039). The subject deficiency was initially reported to RII on August 31, 1979. The licensee submitted an interim and final reports on this matter dated October 1, 1979 and June 2, 1980, respectively. TVA has completed the testing program on the welded stud anchors and concluded that the bending of studs up to 45 degrees has no significant effect on the capacity of the studs. The licensee has determined that no degradation of design capacity of the welded stud anchors at the Phipps Bend Plant has occurred. Based on the conclusions from the testing program, TVA (ENDES) issued new criteria in March 1980 to TVA (Construction) memorandum CEB 800306014 establishing new conservative guidelines for maximum bending of welded stud anchors. This memorandum along with recent TVA procedural (QCI C-306 Rev. 1) and C. F. Braun specification changes (300-06 Rev. 6) were examined by the RII inspector.

c. (Closed) Item 553, 554/80-01-03: Inadequate material traceability for Bergen-Paterson (BP) component support attachments (NCR PBN-051). The licensee initially reported the subject deficiency to RII on December 21, 1979, submitted a final report and supplement to the final report on January 18, 1980 and March 14, 1980, respectively. Review of the supplemental report, discussions with responsible site MEU and QA personnel, and review of traceable material certifications provided by BP revealed that all pipe hanger attachments received at the Phipps Bend site are now properly documented with certified mill test reports. To preclude recurrence of this problem BP has informed TVA they have adopted a policy that requires traceability on ASME component welded attachments whether the drawing specifies it or not. Additionally, BP's engineering office, process group and QC documentation personnel have been informed of this traceability requirement and their QC unit and internal audit personnel are to verify implementation of the requirement.

d. (Open) Item 553/80-10-01, 554/80-09-01: Defects in Rosemont Model 510 DU calibration units and Model 1152 pressure transmitter. The subject nonconformance were initially reported to RII on April 15, 1980, and the licensee has since submitted to interim reports on the matter dated April 25, 1980 and June 20, 1980, respectively. GE has identified ten items of equipment which may contain defective pressure transmitters which have been shipped to Phipps Bend. GE has verbally indicated to TVA the subject trip calibration units are installed in control room panels which have not been shipped to the site. Rosemont will replace the defective switches in affected trip units and the defective capacitors in the affected transmitter units that have been shipped to GE, including those shipped on to utilities by GE. Discussions with electrical QC personnel revealed their investigations into this CDR has resulted in TVA's finding of additional equipment containing model 1152 transmitters other than that identified by GE. TVA has advised GE of their findings and requested additional information to resolve this potential problem. The licensee anticipates transmitting a final report on this matter by September 17, 1980.

e. (Open) Item 553/80-10-02, 554/80-09-02: Failure to include requirements for qualification testing and reporting in purchase specifications (NCR CFB-8). The subject nonconformance was initially reported to RII on April 29, 1980, and the licensee submitted a final report on the subject matter dated May 28, 1980. In general, environmental requirements have been called out in Braun STRIDE procurement specifications consistent with the environmental conditions set forth in GESSAR. Omissions found are not expected to result in defective equipment to be delivered to the site that could impact the health and safety of the public. Braun did, however, fail to require the requirement for qualification testing and report in purchase specifications for mechanical components in STRIDE safety-related areas although in some cases these reports were provided by vendors. Consequently, all purchase specifications on STRIDE were reviewed to determine if

appropriate environmental limits and/or requirements for environmental qualification and reports were included. Those not containing the appropriate information will be revised by C. F. Braun to include a complete set of environmental limits and/or to require environmental qualification of safety-grade equipment and documentation of that qualification. Engineering change notices (ECN's) are to be issued to vendors of equipment already purchased, indicating the revised requirements. Any equipment which is found as a result of the specification changes not to meet the applicable environmental limits will be handled by future nonconforming condition reports. This item remains open pending implementation of the above mentioned corrective action which is expected to be completed by September 30, 1980.

f. (Open) Item 553/80-10-03, 554/80-09-03: Standby gas treatment system charcoal absorber deficiencies (PBN NEB 80-02). The subject deficiency was initially reported to RII on May 8, 1980, and the licensee submitted an interim report on the matter dated June 4, 1980. As a result of an investigation prompted by IEB 80-03 all four charcoal absorbers furnished to TVA by CTI-Nuclear were found to have separations between the charcoal retention screens and the frames to which the screens are mounted. These separations were caused by broken or inadequate spot welds. CTI-Nuclear is investigating the problem and will determine corrective actions. The licensee expects to submit a final report by August 20, 1980.

g. (Open) Item 553/80-10-04, 554/80-09-04: Atlas' Machine and Iron Works QA (PBN QEB 80-01). The subject nonconformance was initially reported to RII on May 13, 1980, and TVA submitted their first interim report on the matter dated June 4, 1980. A TVA audit conducted at Atlas facilities revealed 16 deficiencies in the implementation of the Atlas QA program, nine of which were considered significant. TVA has two resident inspectors at Atlas to monitor contracts. A contract engineer and a QA evaluator have been sent to Atlas to advise and aid in contractual and QA program difficulties. TVA anticipates transmitting their report on this matter by September 19, 1980.

h. (Open) Item 553/80-10-05, 554/80-09-05 (Part 21): Deficient McGraw Edison temperature controllers (PBN-091). The subject nonconformances were initially reported to RII on May 14, 1980, and TVA provided a final report on the matter dated June 13, 1980. TVA was informed by CTI-Nuclear who was previously informed by Edison Electronics Division of McGraw-Edison (Edison) that an electronic temperature detection controller (the same type controllers supplied by Edison to CTI-Nuclear and by CTI-Nuclear to TVA) failed in service and that other similar controllers are potentially defective. Edison attributes the only known failure to use of an acid flux solder which could cause corrosion in the controller and result in failure. Phipps Bends standby gas treatment system housings contain 20 of these potential defective controllers. CTI-Nuclear has requested that TVA remove the 20 potentially defective controllers and ship them to CTI-Nuclear who will forward them back to Edison. Edison plans to replace them with

controllers that have been verified to have been sealed or soldered properly. TVA plans to ship these controllers to CTI-Nuclear by July 31, 1980. Discussion with the EEU-PE personnel revealed this action has not been completed to date. TVA considers 10 CFR Part 21 to be applicable to this responsible deficiency and the RII inspector reviewed the final report for additional 10 CFR 21.21(b)(3) reporting requirements and found it satisfactory. This item will remain open pending verification of implementation of the above corrective action.

i. (Open) Item 553/80-10-06, 554/80-09-06: Design deficient gate valves by Anchor Darling (AD). On May 16, 1980, TVA notified RII that a revision to their final report on this deficiency (dated November 15, 1979, which was originally identified and closed in RII inspection reports 553/79-18-03 and 554/79-17-03) was required. RII received an interim supplement report dated May 27, 1980, stating that differences of opinion for the resolution of the design deficiency of the T-head section on the disk of the AD gate valves have developed between TVA and C. F. Braun. Braun desires the valves be provided with a new disk cast to proper configuration while TVA contents their original proposed solution of the addition of reinforcing weld metal to the T-head section is a reasonable engineering correction. Final corrective actions, as agreed to by all parties will be reported by August 1, 1980.

j. (Open) Item 553/80-10-07, 554/80-09-07: Improper inspection records (M80-6). The licensee initially reported the subject nonconformance to RII on May 20, 1980, and submitted an interim report on this matter dated June 19, 1980. A subsequent telephone conversation conducted on June 25, 1980, between Messrs. Cantrell and Wright from RII and Messrs. Domer and Stout (TVA) resulted in the agreement that TVA would provide a final report on this matter by August 1, 1980. TVA is currently evaluating acceptable documentary methods that will give adequate traceability to the QC inspector who actually performs the work.

k. (Open) Item 553/80-10-08, 554/80-09-08: Rosemont pressure transmitter model 1152 (PRC 80-28). On June 3, 1980, TVA notified RII that the subject transmitter may give false readings in certain over and under-range conditions. These transmitters reportedly have been used since 1964 but there have been no indications of any false readings to date. A written report is due on this matter by July 3, 1980.

l. (Open) Item 553/80-10-09, Unit 1, shroud head and steam separator assembly (PBN-106). On June 13, 1980, the licensee notified RII that the shipping crate containing the subject item caught fire while in storage on the transportation barge. See paragragraph 6d of this report for updated status. A written report is due on this matter by July 14, 1980.

9. Inspector Followup Items (IFI)

a. (Open) Item 553-554/78-08-01: Inspection of weirwall and fuel pool liners (SMC). The licensee conducted an on site prerepair meeting with Stellar Manufacturing Company representatives on June 23, 1980. On June 26, 1980, a SMC representative reported on site to begin repairs to defective welds for both units weirwall liner plates which are currently in storage. TVA is accomplishing the weld repairs to the fuel pool liners with their own welding personnel during fabrication and erection of the fuel pool which is underway.

b. (Closed) Item 553-554/80-01-02: RIS&PM implementation for safety-related equipment transferred from Hartsville storage facilities. Procedures CEP 7.02 Rev. 7, CEP 7.04 Rev. 1, and CEP 13.02 Rev. 3 have been revised so that the preventitive maintenance program is now triggered by one form, "Receiving Inspection Checklist (RIC)". An RIC must now be completed for all purchased or transferred items (with the exception of bulk aggregates and fills) upon arrival at Phipps Bend regardless if evidence exists that the receiving operation was done already at the transferring project. Upon receipt of a signed RIC the PM QC inspector (Material Services Unit) using applicable RIS&PM instructions, vendors manuals and PREVENT user's guide prepares a computer input form for encoding information into the PREVENT program. These procedural revisions when properly implemented should preclude the within house (TVA) transferred item PM problems previously experienced. Discussions with responsible receiving and PM QA/QC inspection personnel revealed the subject problem could be limited to Hartsville transferrals since little if any items have come to the Phipps Bend site from TVA sites other than Hartsville.

10. Status of NRC Inspection & Enforcement Bulletins

a. (Open) IEB 79-28: Possible malfunction of Namco Model EA 180 limit switches at elevated temperatures. The licensee submitted a first and second interim report on this bulletin dated February 6 and March 28, 1980, respectively. None of the subject switches with the referenced date code have been identified for use in NSSS or TVA balance of plant facilities. All STRIDE vendors have been requested by GE to investigate the use of these switches and thus far none have been identified to TVA. The licensee anticipates transmitting a final report to RII on this matter by July 3, 1980.

b. (Closed) IEB 80-02: Inadequate QA for Nuclear supplied equipment. The licensee's response dated May 21, 1980, states, "that feedwater spargers or thermal sleeves manufactured and/or fabricated by Marvin Engineering Co., have not been purchased and/or have not been installed in Phipps Bend units."

c. (Closed) IEB 80-03: Loss of charcoal from standard type II, 2-inch tray absorber cells. TVA's response to RII dated March 21, 1980, was supplemented by a licensee response dated April 25, 1980, to include information on all portions of the plant. Inspection of six charcoal

absorbers manufactured by Mine Safety Appliance Company resulted in the finding that the subject filters were not defective. However, inspection of all absorbers manufactured by in the Standby Gas Treatment System in particular those manufactured by CTI-Nuclear revealed that spot welds in the absorbers appeared to holding but some screen to frame separation was noted between welds. Charcoal has not yet been loaded into these absorbers, therefore, leakage could not be detected. This condition along with some broken or inadequate spot welds were reported to RII on May 8, 1980, as a reportable significant NCR. Corrective actions implemented by the licensee will be followed under LII 553/80-10-03, 554/80-09-03.

c. The following bulletins are being closed out for record because of nonapplicability to Phipps Bend for information only, or no action required by site personnel:

(Closed) IEB 80-05; 80-06; 80-07; 80-10; 80-11; 80-12; 80-13; 80-14; 80-15.