



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-259/91-41; 50-260/91-41, and 50-296/91-41

Licensee: Tennessee Valley Authority
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Docket Nos.: 50-259, 50-260, and 50-296

License Nos.: DPR-33, DPR-52, and DPR-68

Facility Name: Browns Ferry Units 1, 2, and 3

Inspection at Browns Ferry Site near Decatur, Alabama

Inspection Conducted: November 16 - December 15, 1991

Inspector: Paul J. Kellogg for
C. A. Patterson, Senior Resident Inspector

1/9/92
Date Signed

Accompanied by: E. Christnot, Resident Inspector
W. Bearden, Resident Inspector
R. Bernhard, Project Engineer

Approved by: Paul J. Kellogg
Paul J. Kellogg, Chief,
Reactor Projects Section 4A
Division of Reactor Projects

1/9/92
Date Signed

SUMMARY

Scope: This routine resident inspection included surveillance observation, maintenance observation, operational safety verification, power ascension test report review, corrective action program, Unit 3 restart activities, contractor control, reportable occurrences, action on previous inspection findings, and nuclear safety review board.

Results: A violation and deviation were identified concerning the control of contractor work activities. The violation was for failure to have adequate design control of a site telecommunications subcontractor, paragraph eight. A site procedure to control these activities was not utilized. Significant quantities of missing documentation for work performed to implement a design change was identified by the site quality organization. A stop work order was issued.

The deviation was from a reply to a previous violation concerning the removal of fire wrap, paragraph seven. To better control contractor activities, walkdowns were to be resumed using a phased approach. The construction contractor performed safety related work but was not authorized to perform the work. The contractor had only been authorized to perform non safety related work such as scaffolding. This was identified by the site quality organization. Work activities were stopped to correct the problem.

All remaining operational readiness assessment team open items, the power ascension test report, one licensee event report, one unresolved item, one inspector followup item, and five violations were closed.



REPORT DETAILS

1. Persons Contacted

Licensee Employees:

O. Zeringue, Vice President, Browns Ferry Operations
*H. McCluskey, Vice President, Browns Ferry Restart
*J. Scalice, Plant Manager
*J. Swindell, Restart Manager
M. Herrell, Operations Manager
*J. Rupert, Project Engineer
*M. Bajestani, Technical Support Manager
R. Jones, Operations Superintendent
A. Sorrell, Maintenance Manager
*G. Turner, Site Quality Assurance Manager
R. Baron, Site Licensing Manager
*J. McCarthy, Unit 3 Licensing
*P. Salas, Compliance Supervisor
*J. Corey, Site Radiological Control Manager
A. Brittain, Site Security Manager

Other licensee employees or contractors contacted included licensed reactor operators, auxiliary operators, craftsmen, technicians, and public safety officers; and quality assurance, design, and engineering personnel.

NRC Personnel:

P. Kellogg, Section Chief
*C. Patterson, Senior Resident Inspector
*E. Christnot, Resident Inspector
*W. Bearden, Resident Inspector
R. Bernhard, Project Engineer

*Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. Surveillance Observation (61726)

The inspectors observed and reviewed the performance of required SIs. The inspections included reviews of the SIs for technical adequacy and conformance to TS, verification of test instrument calibration, observations of the conduct of testing, confirmation of proper removal from service and return to service of systems, and reviews of test data. The inspectors also verified that LCOs were met, testing was accomplished by qualified personnel, and the SIs were completed within the required frequency.

A review of the TS surveillance requirements and the plant's program for ensuring implementation of the requirements was performed. SSP-8.2, Surveillance Program, Revision 0, dated September 13, 1991 and 2-SI-1, Surveillance Program, Revision 7, dated August 23, 1991 were compared to the requirements of the Unit 2 TS with an effective page list dated November 5, 1991. Over 700 requirements were compared to 2-SI-1 to insure the TS were implemented in the program. From the review, over 30 questions were generated for further inspection. The 30 questions were discussed with individuals in work control who implement the program and the engineer responsible for maintaining 2-SI-1. The questions were resolved or action initiated to address them.

From the review the following observations were made.

- The high on-time completion rate of SIs at BFNP seems to be the result of manpower loading of SIs before other work items, the high visibility the SIs have at the Plan of the Day meetings, and the planning of SI work activities.
- 2-SI-1, which lists the SI requirements, is updated every six months. Changes to the SI are made through submission of a Form SSP-158, SI-1 Surveillance Program Change Form. The system engineer uses the normal procedure for plant procedure changes to implement the SSP-158 changes at the SI-1 update interval. It was noted that a tracking system to insure SSP-158 incorporation does not exist. SI-1 is current only when all outstanding SSP-158s are also considered. It is not currently possible to determine SI-1 status due to lack of tracking of SSP-158s. The current revision of SI-1 reflects the former practice of using PMI-35 forms from the superseded PMI-17.12. SSP-8.2 indicates SSP-158s are QA records with lifetime retention, but does not indicate how to track them.

In addition, SSP-2.3, Administration of Site Procedures, Form SSP-23, Procedure Verification Review Checklist, Step 33 is not specific enough to ensure SI changes that impact frequency, scope changes or name changes generate an SSP-158.

- The TS have requirements to verify initiating logic or control logic in Table 4.2.B. Many of the logic functions are recognized in TS as being functionally verified as part of a channel check or some other TS required test. SI-1 does address these functions in its listings, however the SIs that are performed to meet the logic function do not indicate that their function is also to confirm the system logic. The inspector reviewed several SIs and did not find marked acceptance criteria indicating system logic function was verified. In addition, these SIs did not indicate which other SIs, if multiple SIs are needed to verify system logic, are required to complete the test requirement.

- Some typographical errors were noted in SI-1. In addition, four entries in Attachment 2 indicated "Instrument Channel" when the TS did not. The system engineer was notified of the discrepancies and will correct them on the next procedure revision.
- Attachment 2 of 2-SI-1 indicated a frequency of "12 M" for 4.2.F-2. A TS change made the frequency "6 M". No SSP-158 was found. No changes to the SIs were required as they were already performed at 6 month intervals. TS changes may result in the need for SSP-158s to be generated if SI-1 is impacted, but no other SI change is required that would generate one via the SSP-23 review.
- Interviews with QA indicated a periodic comprehensive audit comparing the TS to SI-1 is not performed. The current program divides the SI audits by responsible organizations and checks that each groups SIs at the time of the organization's audit.
- While verifying SI-4.7.A.3.b met the TS requirements, the inspector discovered the SI manually cycled the vacuum breakers prior to verifying their setpoint. The vacuum breakers setpoint should be determined "as found" to give an indication if they would operate properly if required. The system engineer is processing a procedure change to correct this.

No violations or deviations were identified in the Surveillance Observation area.

3. Maintenance Observation (62703)

Plant maintenance activities were observed and reviewed for selected safety-related systems and components to ascertain that they were conducted in accordance with requirements. The following items were considered during these reviews: LCOs maintained, use of approved procedures, functional testing and/or calibrations were performed prior to returning components or systems to service, QC records maintained, activities accomplished by qualified personnel, use of properly certified parts and materials, proper use of clearance procedures, and implementation of radiological controls as required.

Work documentation (MR, WR, and WO) were reviewed to determine the status of outstanding jobs and to assure that priority was assigned to safety-related equipment maintenance which might affect plant safety. The inspectors observed the following maintenance activities during this reporting period:

a. Teflon Tape

The inspector continued to review the licensee's program for control of usage of teflon tape. Teflon tape is a potential problem in applications with stainless steel due to breakdown of the teflon into fluorine with excessive temperatures and radiation exposure. The



inspector determined that at BFNP teflon tape is controlled as a special issue chemical in accordance with Site Standard Practice SSP - 13.2, Chemical Traffic Control Program. SSP - 13.2 recently replaced SDSP - 24.2 which provided previous guidance and requirements. SSP - 13.2, paragraph 3.5.11 requires the site C & E Superintendent or designee to sign all requisition form 575Ns for all special issue chemicals such as teflon tape. SSP - 13.2 further requires the C & E Superintendent or designee to routinely investigate usage of special issue chemicals and provides special requirements for use of chemicals by contractors working onsite.

The inspector requested the licensee provide a listing of all recent issuance of teflon tape to craft personnel. From this computer listing (power stores transaction history) the inspector determined that teflon tape had been issued on four separate occasions during 1991. Those issuances involved a total of 22 spools of tape. The inspector then reviewed the four Form 575Ns associated with these transactions and noted that each had been cosigned by a representative of the chemistry section and that issuance of teflon tape appeared appropriate for these specific work activities. The work performed under the four referenced work orders were performed on sewage treatment, hypochlorite injection or other systems that did not connect to the RPV. The inspector concurred with the licensee's determination that these examples of teflon tape issuance were authorized usage.

b. Unit 1/2 A Diesel Generator Outage

The inspectors followed licensee activities associated with the scheduled outage on the Unit 1/2 A D/G. This outage was planned to start on December 8, 1991, and involved the performance of the annual and six year inspection of the diesel engine and generator. The inspector noted that the licensee entered LCO 2-91-312-3.9.B.3 at 5:35 a.m. on December 8, 1991, which required that the D/G be returned to operable status within 7 days. The D/G was removed from service under Hold Order 0-91-0840. However the licensee was unable to perform any of the planned activities due to an unplanned scram which occurred on December 9, 1991. The D/G was returned to service and tested at 3:00 a.m. to demonstrate operability to support Unit 2 restart following that unplanned trip. The licensee rescheduled the D/G inspections to occur shortly after the unit is restarted. The inspector did not identify any problems associated with the planned D/G outage.

No violations or deviations were identified in the Maintenance Observation area.

4. Operational Safety Verification (71707, 93702)

The NRC inspectors followed the overall plant status and any significant safety matters related to plant operations. Daily discussions were held with plant management and various members of the plant operating staff. The inspectors made routine visits to the control rooms. Inspection observations included instrument readings, setpoints and recordings, status of operating systems, status and alignments of emergency standby systems, verification of onsite and offsite power supplies, emergency power sources available for automatic operation, the purpose of temporary tags on equipment controls and switches, annunciator alarm status, adherence to procedures, adherence to LCOs, nuclear instruments operability, temporary alterations in effect, daily journals and logs, stack monitor recorder traces, and control room manning. This inspection activity also included numerous informal discussions with operators and supervisors.

General plant tours were conducted. Portions of the turbine buildings, each reactor building, and general plant areas were visited. Observations included valve position and system alignment, snubber and hanger conditions, containment isolation alignments, instrument readings, housekeeping, power supply and breaker alignments, radiation and contaminated area controls, tag controls on equipment, work activities in progress, and radiological protection controls. Informal discussions were held with selected plant personnel in their functional areas during these tours.

a. Plant Status

Unit 2 tripped from 80% power on December 8, 1991, ending 48 days of continuous operation. A 30 ampere fuse blew in the secondary side of a potential transformer. This resulted in actuation of the main generator protective circuit and a generator load reject. A turbine trip and reactor trip followed. The licensee conducted an incident investigation of the event and restarted the unit on December 10, 1991. No reason other than a fatigue failure of the fuse could be identified. There was no work in progress nor were there any power system transients noted at the time of the event. Long term corrective actions are continuing including a modification to the protective circuit. These actions will be followed by the inspector with the closure of the trip report.

b. Leak in Unit 2 Reactor Building Main Steam Tunnel

The inspector reviewed the circumstances associated with an event which occurred on the midnight shift on November 26, 1991, where a minor steam leak was identified by licensee personnel on a four inch RWCU line located in the Unit 2 reactor building main steam tunnel. The gland packing nut had become loose on 2-FCV-69-580 located on the RWCU return line to the feedwater system. Licensee personnel entered the steam tunnel after sensors indicated increasing temperatures. Upon entering the steam tunnel the SRO was able to identify the location of the leak and estimate the size of the leak as .25 gpm.

Due to the licensee's ability to evaluate the problem quickly, the leak was isolated and repaired prior to conditions degrading. The inspector determined that operations personnel responded well to this abnormal condition and identified and corrected a problem which could have led to an automatic shutdown if allowed to continue.

No violations or deviations were identified in the Operational Safety Verification area.

5. Power Ascension Test Report Review (72301, 72532)

The inspectors reviewed the licensee's PATP Start-up Report dated October 29, 1991. The PATP had commenced on February 20, 1991, with the commencement of core reloading and completed on August 6, 1991. The licensee's Unit 2 Cycle 6 report was submitted to the NRC as required by TS 6.9.1.1.

The PATP was performed in three phases and consisted of 21 different power ascension tests. A total of 59 separate test deficiencies were identified during the PATP. Phase I, Open Vessel Testing, was completed on May 21, 1991, with the completion of 2-TI-149, Water Level Measurements, and initial thermal expansion walkdowns. Phase II, Heat-up to 55% Power, commenced on May 23, 1991, with plant startup, and was complete on July 16, 1991, when authorization was received to continue with the power ascension above 55% power. Phase III was complete on August 6, 1991, with the completion of Turbine Generator Torsional Testing.

The inspectors had previously reviewed the PATP as documented in IR 91-26. In this report specific concerns had been raised concerning testing results associated with TI-131, TI-174, and TI-189. The inspector reviewed the test results associated with these three tests with the licensee and determined that the original concerns as described in the above stated inspection report have been satisfied. Additionally the inspector reviewed the listing of test deficiencies and determined that the licensee had dispositioned all but two of the 59 deficiencies. In each case the deficiencies had been dispositioned by reperforming portions of the test, adjustments and/or special testing under a work request, engineering evaluation, or contact with vendor for clarification. The inspector did not disagree with any of the licensee's basis used for closing these test deficiencies.

Two test deficiencies associated with 2-TI-190, System Thermal Expansion, remain open pending further action by the licensee. The inspector discussed these test deficiencies with a region based inspector. The regional inspector reviewed the licensee's evaluations and corrective actions completed to date associated with these two test deficiencies and determined that the licensee's actions were acceptable.

No violations or deviations were identified in the Power Ascension Test Report Review area.



6. Corrective Action Program (30702)

The inspector reviewed recently issued licensee procedures and held meetings with site QA organization personnel for the purpose of determining the status of recent changes to the corrective action program at Browns Ferry. Based on this review the inspector determined that the new program does not represent a significant change in the way that the licensee does business in this area. The new program replaces the use of a single form used for CAQRs and PRDs with two separate forms for use as SCARs, Significant Corrective Action Reports, and PERs, Problem Evaluation Reports. However the actual criteria used to classify a significant condition adverse to quality has not changed. Timeliness requirements and requirements concerning escalation of delinquent action has not changed significantly. An additional change is the creation of a third form for use with FIRs, Finding Identification Reports, which may only be used by NQA organization personnel for non-significant problems identified during performance of a QA audit or monitoring activity. Under the new program existing ACPs, Administrative Control Programs, such as WOs, IIRs, COTS, LERs, etc. will continue to be used similar to as under the old program. The responsibility for tracking and trending of items will be transferred from the site QA organization to site licensing. The inspector reviewed Site Standard Practice SSP-2.3, Finding Identification Reports, SSP-3.6, Problem Evaluation Reports, and SSP-3.4, Corrective Action. These licensee procedures superseded SDSP-3.7 and SDSP-3.13, which covered the old program. Additionally, the inspector monitored training conducted by the Browns Ferry Corrective Action Coordinator on November 25, 1991. This training was one of a series of classes required of all managers and supervisors prior to implementation of the new program. The new program was implemented by the licensee on December 2, 1991. The inspector determined that the new program is the same as the program that is already in place at the licensee's other nuclear facilities. Implementation of the new program at those facilities had already occurred earlier this year and had been intentionally delayed at Browns Ferry as a conscious decision not to change the existing program during the Unit 2 restart. The inspector was informed by licensee personnel there had been problems at the other facilities with the implementation of the new program which resulted in delinquent action backlogs. The inspector was further informed that those problems which have been corrected at the other facilities were due to reduced emphasis on management review under the new program, i.e. lack of a MRC. Browns Ferry intends to implement the new program using the MRC somewhat similar to its' utilization under the old program. Part of the training was reading of a VP BFN Operations Memorandum dated October 31, 1991, which outlined expectations in this area. Specifically mentioned in this memorandum was an expected timeliness rate of 98% with delinquent action backlogs considered as unacceptable performance.

The inspector also reviewed the most recently issued Site Quality Trend Report dated November 5, 1991, to determine the level of timeliness for corrective actions. That report covered trending of Conditions Adverse to Quality, quality assurance findings, external findings, Incident



Investigation Reports, and Corrected on the Spot items for Unit 2 during September 1991. At the end of the month there were 11 open significant CAQRs one of which had delinquent corrective action. There also existed 33 non-significant CAQRs and 15 PRDs at the end of the month. The inspector noted that the overall timeliness rate had continued to improve. The percentage of delinquent items for this period was 8.6% (the rate has continued to decrease from approximately 20% in November 1990). Many site organizations have not had any recent delinquent items. However during the past six months the onsite Nuclear Engineering organization has had an overall 40% delinquency rate. This problem was identified by the licensee's QA organization as an adverse trend and documented under CAQR BFA910216112. No other apparent adverse trends were identified in the licensee report. The inspectors will continue to monitor the licensee's implementation of the new program and report on performance in this area after adequate time has elapsed to allow an assessment of adequacy and timeliness of corrective actions under the new program at this site.

No violations or deviations were identified in the Corrective Action Program Review area.

7. Unit 3 Restart Activities (30702)

The inspector reviewed and observed the licensee's activities involved with the Unit 3 restart. This included reviews of procedures, post-job activities, and completed field work; observation of pre-job field work, in-progress field work, and QA/QC activities; attendance at restart craft level progress meetings, restart program meetings, and management meetings; periodic discussions with both TVA and contractor personnel, skilled craftsmen, supervisors, managers, and executives.

a. Contractor Activities

The inspector observed and reviewed the activities of two of TVA's Unit 3 main contractors, GE and SWEC. The inspector also observed activities performed by additional contractors such as Digital and PCC. The activities included the following:

1) Training

The inspector reviewed and observed training given to SWEC and GE technical personnel. The specific items consisted of procedure MMM No. 2.5, Maintenance Training, which establishes and defines the requirements and responsibilities for implementation of maintenance and modifications services training at BFNP; SWTP 004, Introduction to Regulatory Requirement - TVA's Nuclear Quality Assurance; SWTP 003, Print Reading - Use of TVA Drawings; informal training for familiarization with procedure MAI-4.3, HVAC Duct Systems, which establishes the requirements for fabrication, installation, modification, verification, and documentation of HVAC duct systems; and SWTP-004, Plant Reference Material and Control-Work

Control Process. The training was conducted in a classroom environment, attendance sheets were filled out and for the SWTP's an examination was given to the participants. The inspector concluded from these reviews and observations that SWEC was conducting training for personnel and using TVA's methods.

2) Reactor Vessel Internals

The inspector continued to monitor the activities performed by GE associated with the reactor vessel internals. The IVVI was completed and involved an inspection of the Steam Dryer. Several indications were observed and actions were being taken to address them. This was identified as an IFI in IR 91-38. The jet pump beam replacement was completed. This replacement included removal of the old beams, replacement with new beams and tack welding of the new beams. Other activities included placement of the separator and dryer in the vessel, drain down of the vessel, removal of the steam plugs, placement of the drywell head, and installation of shield plugs.

3) Work Release

The inspector continued to monitor the licensee's and SWEC's activities involved with contractor work authorization. The specific items reviewed were part of the pilot program for work documentation preparation and involved 12 WOs. These WOs were prepared by SWEC personnel, reviewed by SWEC and TVA QA and Unit 3 work control. The inspector observed these activities as the process developed. No significant deficiencies were identified. The licensee approved SWEC activities for preparation of work documents

4) Boot Incident

On November 14, 1991, a licensee QA person questioned if work previously performed by SWEC was within the scope of the contractor work release program. It was determined that the work was outside the scope. A stop work order was issued. An incident investigation was initiated on the problem.

It was determined that on November 4, 1991, SWEC personnel performed work order 91-422447-00. This work involved partial removal of a boot seal at a secondary containment penetration to allow data verification of a pipe support. The work was authorized by Plant Operations and conducted in accordance with the procedure. However, SWEC personnel were only authorized to do scaffolding work at the time under the contractor work release program. The contractor work release program was outlined in IR 91-40.



The licensee determined that the CWL program was not communicated downward to the craft level. There was general confusion about implementation and understanding of the program. The licensee initiated several corrective action steps to correct the problem. These included withdrawing all work orders from construction until they could be reviewed for scope definition. Only scaffolding WOs were released. All SWEC supervisors and engineers were to be retrained in the CWL program.

The inspector reviewed the licensee reply to NOV 91-26-02 concerning removal of fire wrap from operable equipment. In this reply it was stated that actions taken to improve the control of inspection requests of contractor walkdown activities would be resumption of these activities using a phased approach. This was not done for the construction contractors. SWEC was not scheduled to be released to perform safety related work activities until December 9, 1991. This is a deviation from the NOV reply to 91-26-02. This item is identified as DEV 296/91-41-01, Control of Construction Contractor Work Activities.

- 5) On December 9, 1991, the licensee initiated a plan of the day meeting for Unit 3 restart activities. The inspector attended several of the meetings. The meetings are attended by senior licensee and contractor personnel.

b. Operations Activities

The inspector reviewed and observed the Unit 3 operations activities involved with the reactor vessel drain down. This activity was performed in accordance to procedure 3-SOI-31A, Drain Down of U-3 Reactor Vessel and Cavity to Condensate Storage System. The operations group and various support groups held several pre-job planning meetings and briefings. The inspector noted that a scheduling fragnet was developed to indicate to personnel the various times at which certain activities were to occur. These activities included system line ups to drain the water to #5 storage tank, placement of the steam separator and dryer into the reactor vessel, and removal of the main steam line plugs. The inspector concluded that these activities were controlled by approved procedures and performed by qualified individuals.

One deviation was identified in the Unit 3 Restart Activities.

8. Contractor Control (37702)

The inspector continued to review the activities of the sub-contractor, Key Communications, and the resulting incident investigation. The review involved field work and design change activities associated with DCNs



W9276A, W9277A, and W9279A. The review indicated that DCN W9276A was issued to replace existing phone switch and make associated changes in the Plant Communications Room, located on the 1C level of the Control Bay. DCN W9277A was issued to delete wires and cables in order to allow switch replacement and DCN W9279A was issued to install cables, splices, and terminations in the yard area outside the power block and in the turbine building. The followup indicated that a WP for DCN W9276A was required to be written to implement the DCN and none was written although the new switch was made operable. WP-0087-91 was written to implement DCN W9277A and the WP was never signed into work status although it was a prerequisite for DCN 9276A. WP-2045-91 was written to implement DCN 9279A and was signed into work and never utilized. This resulted in the work associated with WP 2045-91 being near to completion and with no documentation.

10 CFR 50, Appendix B, Criterion III, Design Control, requires that measures shall be established for the identification and control of design interfaces and for coordination among participating design organizations. The licensee uses SDSP 16.17 to control contractor activities. These requirements were not met or followed for the subcontractor. Work plans were not utilized and on October 13, 1991, electrical cables were cut servicing the PREAS. In Inspection Report 91-40, this item was identified as a URI. This item is changed to a VIO 259, 260, 296/91-41-02, Inadequate Design Controls for Sub-Contractor.

One violation was identified in the area of Contractor Control:

9. Reportable Occurrences (92700)

The LERs listed below were reviewed to determine if the information provided met NRC requirements. The determinations included the verification of compliance with TS and regulatory requirements, and addressed the adequacy of the event description, the corrective actions taken, the existence of potential generic problems, compliance with reporting requirements, and the relative safety significance of each event. Additional in-plant reviews and discussions with plant personnel, as appropriate, were conducted.

(CLOSED) LER 260/91-13, T.S. Violation Following Loss of Primary Containment Caused by Personnel Error.

This LER had been submitted by the licensee due to the same breach of primary containment event described in VIO 91-23-01 closed in this IR. The inspector reviewed the licensee's corrective actions associated with this LER as part of the followup review of corrective actions associated with the violations issued for this event.



10. Action on Previous Inspection Findings (92701, 92702)

- a. (CLOSED) IFI 259, 260, 296/91-38-04, Procurement Stop Work

This item was originally identified when the inspector was informed QA had issued SWOs concerning BNA activities. The inspector reviewed two SWOs identified as BFSW-001 and BFSW-002. The inspector noted that both SWOs clearly indicated the activities that were to be stopped, the reasons for the SWOs and the corrective actions needed to lift the SWOs. The inspector concluded from this review that QA reviewed BNAs activities and had taken appropriate action as needed.

- b. (CLOSED) URI 259, 260, 296/91-40-02, Adequacy of Design Controls During Sub-Contractor Activities.

The item was originally identified when on October 13, 1991, information was received that indicated a sub-contractor, Keys Communication, was disconnecting PREAS readers. These PREAS terminals are used as part of the personnel accountability system during a radiological event. As a result of review and followup, this item was changed into a VIO 259, 260, 296/91-41-02, Inadequate Design Controls for Sub-Contractor.

- c. (CLOSED) VIO 259, 260, 296/91-10-03, Inadequate Test Controls

This VIO was issued for two examples of failure to implement test control measures for returning components to service. The first example was identified when on March 18, 1991, during integrated leak rate test, the reactor building torus vacuum breakers opened when the torus pressure was greater than the reactor building pressure. The second example was identified when on October 4, 1990, during the performance of a SI, the A3 RHRSW pump did not start.

The inspector reviewed the licensee's response to the VIO, dated June 21, 1991. The licensee indicated that for the first example an adequate review was not performed for a FCR. The design for the pressure differential switches for the vacuum breakers was controlled by ECN P3051 and the installation of the switches was controlled by WP 2036-84. During the installation a FCR was not reviewed for PMT. The licensee indicated that for the second example personnel failed to adhere to PMI 17.1, Conduct of Testing, which requires that equipment awaiting PMT be adequately tagged. Had the PMT been performed the failure of A3 RHRSW to start would have been detected.

The inspector reviewed the licensee's corrective which included the requirement in SDSP 12.4 that FCRs, now referred to as FDCNs, be reviewed for PMT and that all licensed and non-licensed operator review incident investigation number II-B-91-074. The inspector determined that the corrective action had been completed.

- d. (CLOSED) VIO 259, 260, 296/91-24-02, Failure to Follow Clearance Procedures.



This VIO had been issued due to the licensee's failure to follow applicable procedures which resulted in an event where the 1D D/G was motorized. On July 9, 1991, while releasing Hold Notice 0-91-0501 following maintenance on the 1D D/G the .25 amp position indication fuse was incorrectly installed in the control power circuit. The actual control power fuses are required to be 15 amp fuses. The individual that reinstalled the fuses had transposed the position indication fuses and control power fuses. The individual then racked in the breaker but failed to trip check the breaker. Had that step been performed the .25 amp fuses would have blown at that point. Independent verification was later performed on the fuse reinstallation which failed to identify the error. Later following two hours of operation performed as PMT, the D/G the generator output breaker could not be tripped from the control panel in the control room. The breaker remained closed for approximately seven minutes before it was tripped locally.

Following to the event the licensee removed the D/G from service to perform engine and generator tests to determine if any equipment damage had occurred. No damage was identified, and the D/G was returned to operable status on July 10, 1991.

The inspector reviewed the licensee's response to the VIO dated September 5, 1991. In that response the licensee attributed the failure to personnel error by the individual that reinstalled the fuses and the second individual required to perform independent verification of the activity. As corrective actions the licensee took personnel action against the individuals involved and committed to conduct additional training on procedural requirements associated with racking in breakers and independent verification for all operations personnel. The inspector reviewed Final Event Report, II-B-91-135, which documented the licensee's investigation of this event. Additionally, the inspector examined training attendance records related to this event for operations personnel. The training sessions included specific training on Final Event Report, II-B-91-135, SDSP 3.15, Independent Verification, and breaker operations. Based on this review the inspector determined that the completed corrective actions should be adequate to prevent reoccurrence.

- e. (CLOSED) VIO 259, 260, 296/91-23-01, Breach of Primary Containment when Reactor was Critical

(CLOSED) VIO 259, 260, 296/91-23-02, Failure to Follow Work Control Procedures

(CLOSED) VIO 259, 260, 296/91-23-03, Inadequate Procedures to Control Drywell Entry when Containment Integrity is Required.

These three VIOs were categorized in the aggregate as a Severity Level III problem and involved escalated enforcement with a civil



penalty for licensee actions which led to an event that occurred on June 5, 1991, when primary containment was not maintained during a time while the reactor was critical and at 150 psig and 365 degrees F. This event occurred as the result of both drywell personnel access doors being open while licensee personnel were in the Unit 2 drywell performing thermal expansion walkdowns during the PATP. Interlocks for both drywell doors were defeated at 2:45 a.m. on June 5, 1991, to facilitate frequent entry by personnel performing the walkdowns. This occurred without the approval and notification of the SOS. The failure was identified by appropriate licensee personnel at 6:30 a.m. and primary containment integrity immediately restored. Licensee management decided to place the plant in cold shutdown at 10:00 a.m. The unit was not restarted until June 10 after the licensee had conducted a detailed investigation into the event and initiated a planned corrective action program associated with the event.

The inspector reviewed the licensee's response to the violations dated September 6, 1991. In that response the licensee attributes the failure to an unauthorized action by a mechanical maintenance craftsman. Contributing factors in this failure were lack of attention by those personnel in the direct area during the event, inadequate procedures which failed to control containment entry and the method used to defeat the door interlocks which resulted in an erroneous door position indication in the control room. The response also provided the details of the licensee's corrective action plan which included the following:

Those personnel directly involved in defeating the drywell door interlocks received disciplinary action. Personnel that were shown to have observed the drywell doors open but did not question the condition were counseled.

Employee training sessions were conducted to outline a new improved operating plant philosophy. The training sessions included a description of the event, plant personnel responsibilities, and SOS authority and responsibility. Additional training was provided to maintenance craft and supervisory personnel on expected performance and documentation of assigned work.

Existing plant procedures that were considered inadequate were revised to more clearly describe requirements for drywell entry when primary containment integrity is required.

TVA has developed various programs intended to enhance job performance of maintenance craftsman and supervision. These include a screening and evaluation program to assess job performance of maintenance foreman. This program is intended to include screening and evaluation of both current foreman and future candidates to ensure they possess adequate skills to perform their supervisory duties. Additionally the licensee's

general employee training program will be enhanced to emphasize the importance of the plant's safety barriers and responsibility to follow procedures.

The inspector verified current revisions of licensee procedures to verify that corrective actions had been completed in this area. 2-OI-64, Primary Containment System Operating Instruction, was revised to require that all door manipulations will be performed by operations personnel and that at least one of the two airlock doors be closed always when primary containment is required. SDSP 14.15, Entry and Work in the Primary Containment, was revised to require that drywell entries be performed in accordance with 2-OI-64 while primary containment is required and that entries be performed in accordance with MMI-129, Opening and Closing of Drywell Personnel Airlock Doors, while primary containment is not required. MMI-129 was revised to change the method of defeating the interlocks so control room indication of door position was not affected, to allow defeating interlocks only when primary containment is not required and to require SOS notification prior to defeating interlocks.

Based on conversations held with selected licensee personnel the inspector determined that personnel were knowledgeable of the event and that adequate training on sensitivity to operating plant requirements had occurred. The inspector also noted that special training on drywell door operation, primary containment TS, and correct method of defeating interlocks had been conducted during the period directly prior to the decision to restart the unit on June 10, 1991. Two sessions of this training had been monitored by NRC shift inspectors as part of the continuous shift coverage that was occurring during that time period. Additionally the inspector determined that the licensee's new program for craft supervision had been implemented. The first class of maintenance foreman which includes elements of the proposed screening and evaluation process is currently ongoing and scheduled for completion prior to the end of this reporting period.

f. ORAT Open Item Closure

An ORAT inspection was conducted prior to restart of Unit 2. Thirteen open items were identified in IR 50-260/91-201. A followup was performed and documented in IR 50-260/91-202. In IR 91-202 open items 1, 2, 4, 6, 7, 8, and 11 were closed. One new item was identified in IR 91-202 which was closed in IR 91-26. The team verified that all corrective actions to address the restart concerns had been implemented except review of the final incident investigation report concerning the fuel handling event. Closure of the remaining items follows:

1.) (CLOSED) Open Item 260/91-201-03, Fuel Handling Event Final Incident Investigation Report.

The inspector reviewed the licensee's final incident investigation report. The report was revised to include a human performance evaluation system. This evaluation provided more comprehensive recurrence controls and identified problem areas related to the event.

- a.) Inadequate verbal communication - adequate information transfer did not occur between personnel involved in the event.
- b.) Inadequate written communication - procedural guidance was not provided on signal spikes related to noise.
- c.) Poor work practices - incomplete troubleshooting was performed to resolve the case of the unusual spikes.
- d.) Poor managerial methods - high standards for resolving problems before continuing activities not effectively communicated.

The results of the incident investigation report were discussed in a TVA/NRC management meeting held at the site on May 13, 1991. Several incident investigation improvements were discussed in the meeting including an overall program effectiveness review. The inspector concluded that a thorough self-critical review of the event was conducted. This was essential for effective problem resolution after the plant restart.

2.) (CLOSED) Open Item 260/91-201-05, Correction of Procedure Deficiencies Including Procedure Style Guide Terminology and Definitions

The inspector reviewed the licensee's response and closure package for this item. Site Standard Practice 2.2, Writing Procedures was issued on October 8, 1991. The procedure combines the style guide for writing instructions and site writers guides into one document. Guidance is provided in the SSP on logic terms, referencing and branching, emphasis techniques, and definition of terms.

Procedural discrepancies were identified in 2-OI-71, 0-OI-57D, and 2-OI-74. Procedure changes were made or addressed to correct the discrepancies. Additionally, a memorandum was issued by Operations management to remind personnel of their responsibilities and the importance of taking time when verifying procedure revisions. The inspector reviewed the licensee response procedure revisions and operations memorandum. This item was resolved by these actions.



3.) (CLOSED) Open Item 260/91-201-09, Locked Valve Program Training

The inspector reviewed the licensee's response and closure package. Live-time training was conducted for the operating crews. The lessons plans and attendance sheets were reviewed. Items addressed were the locked-valve program, independent verification, versus second party verification, and surveillance and procedural adherence. These actions resolved the concern.

4.) (CLOSED) Open Item 260/91-201-10, Independent Verification Training

The inspector reviewed the licensee's response and closure package for this item. Several weaknesses were noted during a walkdown of 1-SI-4.5.B.11, RHR Unit 1 X-tie for Unit 2 Operation. The weaknesses were addressed or a SI revision made. Training was conducted with item 260/91-201-09. These actions resolve the concerns.

5.) (CLOSED) 260/91-201-12, Weaknesses in Training Program

The inspector reviewed the licensee's closure package and reply for this item. The ORAT identified that adverse trend control limits for several indicators were too high. When no audits were performed during a period a reject rate of zero was entered. Some trend data was not being forward to site QA as required. The licensee eliminated the control limits. Each item trended is now analyzed on its own significance, merit, or impact. More discussion and analyses of the item was required from line organizations for the trend report. When no audit is performed the trend indicates no data instead of zero. Site QA contacted the various line organizations to insure all required data is forwarded to site QA. The inspector reviewed some QA trend reports and the reports provide detailed explanations of the indicators. Where no audit was performed no data is indicated. These actions resolve the concern.

6.) (CLOSED) 260/91-201-13, Improvements in Incident Investigation Reports

The inspector reviewed the licensee's closure package and response for this item. Changes were made to the final event report package to identify team members trained in root cause analysis. Other specific items were addressed in the response of closure package. In a TVA/NRC management meeting on May 13, 1991, the improvements to incident investigations were outlined. These are as follows:

- training - basic root cause analysis techniques
- human performance enhancement system methodology
- increase number of qualified investigators

- plant manager approval of team composition for category 1 events
- category 1 events reviewed by multidiscipline management committee
- freezing of event scene and immediate conduct of interviews
- improved trending system
- overall program effectiveness review

A new Site Standard Practice 12.9, Incident Investigation and Root Cause Analysis, was issued on September 4, 1991. This was a new procedure to implement Corporate Standard 12.9.

In general since the plant restart on May 24, 1991, the inspector has noted a general improvement in the effectiveness of incident reports. They have been thorough and self-critical. These actions resolve the concern.

In summary all ORAT open items are closed.

Item	Inspection Report Closed
260/91-201-01	91-202
260/91-201-02	91-202
260/91-201-03	91-41
260/91-201-04	91-202
260/91-201-05	91-41
260/91-201-06	91-202
260/91-201-07	91-202
260/91-201-08	91-202
260/91-201-09	91-41
260/91-201-10	91-41
260/91-201-11	91-202
260/91-201-12	91-41
260/91-201-13	91-41
260/91-202-01	91-16

11. Nuclear Safety Review Board

The inspector attended selected activities of the NSRB conducted December 12, 1991. Plant management discussed NSRB items of interest. Areas covered included both Unit 2 and Unit 3 activities. Major items of interest were foreign material exclusion, the management review committee's function with respect to the CAQR process, Unit 3 progress and



schedule, incorporation of Unit 2 lessons learned into the Unit 3 program and a report on Unit 3 fuel inspection results.

The NSRB members were interactive with the management on the issues discussed. Several items for plant action were identified. Results of NSRB directed audits were discussed. For those activities reviewed by the inspector, the NSRB's activities were consistent with the requirements of the TS.

12. Exit Interview (30703)

The inspection scope and findings were summarized on December 16, 1991 with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and discussed in detail the inspection findings listed below. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during this inspection. Dissenting comments were not received from the licensee.

Item Number	Description and Reference
296/91-41-01	DEV, Control of Construction Contractor Work Activities, paragraph 7.
259, 260, 296/91-41-02	VIO, Inadequate Design Controls for Sub-Contractor, paragraph 8.

Licensee management was informed that 6 ORAT items, 1 LER, 1 IFI, 1 URI; and 5 VIOs were closed.

13. Acronyms and Initialisms

ACP	Administrative Control Program
BFNP	Browns Ferry Nuclear Plant
BNA	Bechtel North America
CAQR	Condition Adverse to Quality Report
C&E	Chemistry & Environmental
CFR	Code of Federal Regulation
COTS	Corrected on the spot
CWL	Contractor Work Release
DCN	Design Change Notice
DEV	Deviation
D/G	Diesel Generator
ECN	Engineering Change Notice
FCR	Field Change Request
FDCN	Field Design Change Notice
GE	General Electric
GPM	Gallons Per Minute
HVAC	Heating, Ventilation, & Air Conditioning
IFI	Inspector Followup Item
IIR	Incident Investigation Report

IR	Inspection Report
IVVI	In Vessel Visual Inspection
LCO	Limiting Condition for Operation
MAI	Modification Alteration Instruction
MMM	Maintenance Management Manual
MR	Maintenance Request
MRC	Management Review Committee
NOV	Notice of Violation
NQA	Nuclear Quality Assurance
NRC	Nuclear Regulatory Commission
NSRB	Nuclear Safety Review Board
OI	Operating Instruction
ORAT	Operational Readiness Assessment Team
PATP	Power Ascension Test Program
PCC	Project Cost and Control
PER	Problem Evaluation Report
PMI	Plant Manager Instruction
PMT	Post Maintenance/Modification Test
PRD	Problem Reporting Document
PREAS	Personnel Radiological Accountability System
QA	Quality Assurance
QC	Quality Control
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RPV	Reactor Pressure Vessel
RWCU	Reactor Water Cleanup
SDSP	Site Director Standard Practice
SI	Surveillance Instruction
SOI	Special Operating Instruction
SRO	Senior Reactor Operator
SSP	Site Standard Practice
SWEC	Stone Webster Engineering Company
SWO	Stop Work Order
SWTP	Stone Webster Training Program
TS	Technical Specification
TVA	Tennessee Valley Authority
URI	Unresolved Item
VIO	Violation
WO	Work Order
WP	Work Plan
WR	Work Request

