



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

Report Nos.: 50-259/90-05, 50-260/90-05, and 50-296/90-05

Licensee: Tennessee Valley Authority  
 6N 38A Lookout Place  
 1101 Market Street  
 Chattanooga, TN 37402-2801

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: February 16 - March 16, 1990

Inspectors: *Rudolph H. Beal* 4/17/90  
 for D. R. Carpenter, NRC Site Manager Date Signed

*Rudolph H. Beal* 4/17/90  
 for C. A. Patterson, NRC Restart Coordinator Date Signed

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

Approved by: *Bruce A. Wilson, for* 4/17/90  
 W. S. Little, Section Chief, Date Signed  
 Inspection Programs,  
 TVA Projects Division

SUMMARY

Scope:

This routine resident inspection included surveillance observation, maintenance observation, review of ECP subcategory report operational safety verification, modifications, restart test program, action on previous inspection findings, and licensing activities.

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**Results:**

A violation was identified for failure to maintain operable fire hose stations as required by TS. This was in addition to two previous violations and several LERs during the past two years concerning compensatory fire protection measures. A system and procedures were in place to correctly identify and control compensatory fire protection measures, but management control of the system was not effective, paragraph 5.a.

A violation for failure to verify power available during an electrical power source transfer was identified, paragraph 5.c. Although the defueling of Unit 2 was carried out in a controlled and methodical manner, the licensee's review of the cause of a bent refueling boom revealed procedural and training inadequacies, paragraph 5.b.

During 1989 and continuing in 1990 replies to Notice of Violation were not timely and frequent extensions were requested to the time requirements of 10 CFR 2.201, paragraph 9.



## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees:

O. Zeringue, Site Director  
\*G. Campbell, Plant Manager  
M. Herrell, Plant Operations Manager  
R. Smith, Project Engineer  
J. Hutton, Operations Superintendent  
A. Sorrell, Maintenance Superintendent  
G. Turner, Site Quality Assurance Manager  
P. Carrier, Site Licensing Manager  
\*P. Salas, Compliance Supervisor  
J. Corey, Site Radiological Control Superintendent  
R. Tuttle, 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 Employees

\*W. Little, Section Chief  
\*C. Patterson, Restart Coordinator  
\*E. Christnot, Resident Inspector  
\*W. Bearden, Resident Inspector  
\*K. Ivey, Resident Inspector

\*Attended exit interview

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

### 2. Surveillance Observation (61726)

The inspectors observed and/or reviewed the SI procedures discussed below. The inspections consisted of a review of the SIs for technical adequacy and conformance to TS, verification of test instrument calibration, observation of the conduct of the test, confirmation of proper removal from service and return to service of the system, and a review of the test data. The inspector also verified that limiting conditions for operation were met, testing was accomplished by qualified personnel, and the SIs were completed at the required frequency.

- The inspector observed portions of O-SI-4.9.A1.a(A), "Monthly Operability on 1A Diesel Generator". No deficiencies were identified with the performance of this SI.



- The inspectors observed portions of the preparations, equipment setup, and performance of 3-SI-4.9.A1.d(3A), "Annual Inspection on 3A Diesel Generator". This surveillance consists of making routine internal components inspections for the diesel generator and took approximately five days to perform. The only problem that the licensee experienced was a PMT deficiency identified when the diesel failed to obtain the required speed of 900 - 910 RPM. The indicated speed was 897 RPM and this was evaluated and found to be a problem with the tachometer calibration. The tachometer was recalibrated and the PMT considered acceptable.

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

### 3. Maintenance Observation (62703)

Plant maintenance activities on selected safety-related systems and components were observed/reviewed to ascertain that they were conducted in accordance with requirements. The following items were considered during this review: limiting conditions for operations were met; activities were accomplished using approved procedures; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; clearance procedures were adhered to; Technical Specifications were met; and radiological controls were implemented as required. Maintenance requests were reviewed to determine the status of outstanding work activities and to assure that priority was assigned to safety-related equipment maintenance which might affect plant safety.

An inspector observed portions of the annual inspection for DG 3D (PM F1672). This work was performed in accordance with MMI-6, "Scheduled Maintenance of the Standby Emergency Diesel Generator Engines," Section C. This was part of the planned PM program for the DG engines. No deficiencies were identified.

An inspector observed portions of the replacement of the outlet scram valve actuator diaphragms on the Unit 2 "east side" hydraulic control units. This work was performed in accordance with MCI-0-085-VLV003, "Outlet Scram Valve Disassembly, Valve Packing Replacement, Actuator Diaphragm Replacement, Valve Seat Replacement, and Valve Reassembly". No deficiencies were identified.

An inspector observed activities associated with electrical signal tracing and reviewed associated MRs (see paragraph 6.c). No deficiencies were identified.

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

#### 4. Review of ECP Subcategory Report

An inspector reviewed ECTG subcategory report 31000, "Operations/Operational," to determine if any of the employee concerns were applicable to Browns Ferry and what corrective actions were taken. Element 31003 included an employee concern, IN-86-055-003, involving the improper control of root valves for tygon tubing used for temporary level indication at Watts Bar. The subcategory report determined that this employee concern was applicable to Browns Ferry because tygon tubing is used for temporary vessel level monitoring during a vessel drain down for jet pump work and recirculation riser piping repair work. CATD 310.03-BFN-01 was issued to revise Standard Practice BF 14.25, "Clearance Procedure", to require that tygon tubing used for temporary level indication be controlled by a caution order. This item was closed by ECP reviewers. The procedure revision was verified by NRC inspection (IR 88-22); however, the inspectors determined that the procedure revision did not address control of the root valves, which was the initial problem.

During this inspection, the inspector noted that the current equipment clearance procedure, SDSP 14.9, did not contain the requirement for a caution on tygon tubing, nor did it address the control of root valves for tygon tubing. From a review of an updated CATD and associated documentation, and discussions with licensee personnel, the inspector determined that the licensee had deleted the requirement during a general revision of the procedure. Furthermore, licensee personnel stated that the caution was not necessary since the program which is in place to control temporary changes will provide more appropriate control than a caution order. PMI-8.1, "Temporary Alterations", provides administrative control for all temporary alterations at Browns Ferry. This procedure includes reviews of a TACF by Technical Support and Operations, and approval of the TACF by the PORC. The inspector concluded that the TACF process should adequately ensure the control of temporary tygon tubing at Browns Ferry.

The ECTG utilized CATD's to ensure that corrective actions were implemented for valid employee concerns. Even though the actions were acceptable for this employee concern, removing the requirement for a caution order from the clearance procedure after closure of CATD 310.03-BFN-01 is of concern to the NRC. It appeared that the revision was made without addressing the fact that the requirement was a ECP corrective action. Licensee personnel indicated that SDSP 2.1, "Site Procedures", was revised in June 1988 to require that a note is included with each procedure step associated with ECP corrective action commitments. This revision should provide assurance that procedural corrective actions taken since June 1988 are maintained; however, this is not true for procedural corrective actions implemented prior to June 1988. The inspector brought this issue to the attention of licensee management at the exit meeting on



March 16, 1990. The licensee stated that they would develop an action plan and work with the NRC Resident Inspectors to resolve this concern. This issue is identified as IFI 259, 260, 296/90-05-01, ECP Corrective Actions.

No violations or deviations were identified during the review of ECP Subcategory Reports.

5. Operational Safety Verification (71707)

The NRC inspectors were kept informed of 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; onsite and offsite emergency power sources available for automatic operation; purpose of temporary tags on equipment controls and switches; annunciator alarm status; adherence to procedures; adherence to limiting conditions for operations; 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 positions and system alignment; snubber and hanger conditions; containment isolation alignments; instrument readings; housekeeping; proper power supply and breaker alignments; radiation area controls; tag controls on equipment; work activities in progress; and radiation protection controls. Informal discussions were held with selected plant personnel in their functional areas during these tours.

a. Fire Protection Problems

(1) Observation

During a routine tour of the reactor building on February 27, 1990, the inspector observed two signs that appeared to contradict each other at a fire hose station. The station was in the Unit 2 reactor building at fire hose R2-6. One sign stated "HOSE STATION OUT OF SERVICE," and the other stated "COMPENSATORY FIRE HOSE FOR UNIT 1 ELEVATION 639." The inspector observed a gated wye connection in Unit 3 connected to a single 50 foot roll of hose, and that the fire hose station in Unit 1 was also out of service. Similar conditions were on elevation levels 621, 593, and 565. The inspector went to the control room and discussed the conflicting signs with the operations staff. The operator was unable to explain the signs and initiated a phone call for an explanation.



(2) Removal from Service Permits

The inspector asked to review the fire protection removal from service permits, but they were not in the control room. These permits are termed "Attachment F" and list the compensatory requirements when fire protection equipment is removed from service. The Fire Protection Equipment and Barrier Penetration Removal from Service Permit (Attachment F) are processed in accordance with procedures FPP-2, "Fire Protection - Attachments". The book containing the Attachment Fs was located in the operations work control center two elevations below the control room. The inspector reviewed the book but only a four page summary of the Attachment Fs was in the book, without a description of the compensatory measures. The inspector went to the fire protection building and found the Attachment Fs. The signs represented a condition in the reactor building where the hose station for Unit 3 was being used for Unit 2 and the hose for Unit 2 was being used for Unit 1. Upon a fire in Unit 1, a hose from the gated wye connection in Unit 3 would be extended to the Unit 2 hose station, the hose at Unit 2 would have to be disconnected from the station and connected, and then the Unit 2 hose extended to Unit 1. The inspector discussed with a member of operations management on February 28, 1990, that operations personnel seemed unaware of the compensatory fire measures and the TS responsibility was in effect delegated to the fire protection staff.

(3) TS Requirements

The inspector reviewed the TS requirements of 3.11.E concerning fire hose stations. TS 3.11.E requires that the fire hose stations shown in Table 3.11.c shall be operable whenever equipment in the areas protected by the fire hose stations is required to be operable. When a hose station is inoperable, a gated wye shall be connected to the nearest operable hose station. One outlet of the wye shall be connected to the standard length of hose provided for the hose station. The second outlet of the wye shall be connected to a length of hose sufficient to provide coverage for the area left unprotected by the inoperable hose station. Also, where it can be demonstrated that the physical routing of the fire hose would be a hazard, the fire hose shall be stored in a roll at the outlet of the operable hose station. Signs shall be mounted above the gated wyes to identify the proper hose to use.

(4) Violations

On March 1, 1990, the inspector discussed with the Operations Manager that the plant was outside TS 3.11.E. It was discussed that the hoses were not connected or routed, and the adequacy of

using a single Unit 3 hose station for compensatory measures for both Unit 2 and Unit 1. This was an example of violation of TS 3.11.E in that the inoperable fire hose stations were not connected to an outlet of a gated wye connection with sufficient length of hose to provide coverage for the areas left unprotected by the inoperable hose stations. This is the first example of violation 259, 260, 296/90-05-02, Inadequate Compensatory Fire Protection Measures.

Action was initiated by operations management to review the TS. The licensee found that the existing hold order (0-90-160) for Units 1 and 2 had been extended to include Unit 3 on March 1, 1990 due to substantial leakage through the isolation valves. There were no operable hose stations in the Units 1, 2, and 3 reactor building. This is the second example of violation 259, 260, 296/90-05-02.

(5) Licensee Corrective Actions

The licensee initiated actions to restore the Unit 3 system to operation. This was completed on March 5, 1990. This issue was discussed with all the shift supervisors on March 2, 1990. Hot work activities (welding, grinding, etc.) in the reactor building were stopped. The fire truck and fire protection personnel were placed on standby. Sufficient hose length was connected to Unit 3 hose stations to reach the other units. The licensee stated the hoses were not routed due to the number of modifications activities occurring in the plant.

(6) Safety Assessment

During the review of this event it was determined that the fire suppression systems were operable for Units 3 and 1 and inoperable for Unit 2. A source of water was available, although TS 3.11.E requirements were not met. All three units were defueled at the time, which minimizes the equipment required to be in service and reduces the portions of the fire protection system required to meet TS.

The above violation (90-05-02) when considered with other violations identified by the NRC and TVA over the past two years raises concern about management attention to the fire protection program at Browns Ferry. The other problems are as follows:

Violation 89-33-04, Breach of Fire Door. This involved one example of failure to implement compensatory measures required by TS LCO 3.11.G.1.a for inoperable fire rated assemblies.

Violation 89-43-04, Failure to Maintain TS Compensatory Measures for Inoperable Fire Hose Stations. This involved one example of failure to maintain compensatory measures required by TS LCO 3.11.E.1.a for inoperable fire hose stations. This apparent violation was subsequently included in a Severity Level III violation of the SI program.

LER 259/88-26, Violation of Fire Protection Technical Specification Due to Personnel Error. This involved four examples of failure to implement compensatory measures required by TS LCO 3.11.G for blocked open fire doors without operable fire detection systems on either side of the doors.

LER 259/89-05, Plant Technical Specification Surveillance Requirement Exceeded Due to a Misinterpretation by Supervision Responsible for Patrolling Firewatches. This involved one example of continuous failure to implement compensatory measures required by TS LCO 3.11.A.1.b for fire protected zones or areas with inoperable detectors.

The inspector concluded that a system and applicable procedures were in place to correctly identify and control compensatory fire protection measures. However, management control of the system was not effective and there appeared to be a lack of adequate knowledge of the compensatory fire protection in place at any given time by the plant operations staff. The licensee is requested to address these concerns in their response to Violation 90-05-02.

The focus of the review was the reactor building and did not include a detailed assessment of other plant areas and other times the violation may have occurred.

(7) Other Locations

At the same time the Units 1 and 2 reactor building hose stations were removed from service, the common Units 1 and 2 Diesel Generator Building fire protection was removed from service. Fire hoses were routed from a fire hydrant. There is no provision for this in TS 3.11.E, although this appeared to be a reasonable method of providing fire protection to the D/G Building. Nevertheless, as a conservative measure, hoses were connected to an operable Unit 3 hose station in elevation 1C of the control bay for routing down the corridor and into the D/G building.

(8) Diesel Drive Fire Pumps Tour

On March 14, 1990, three NRC inspectors accompanied by fire protection and operations personnel toured the diesel driven fire pumps facilities on site. The fire protection system

consists of an inside loop consisting of three electric fire pumps and a 2500 gpm diesel driven fire pump supplied by river water. An outside loop consists of a 300,000 gallon bladder and associated 2000 gpm diesel driven fire pump located outside the switchyard and a 250,000 gallon bladder and associated 1500 gpm diesel driven fire pump located at the low level radwaste storage facility. The outside loop is supplied by potable water from the City of Athens. The licensee also has two fire trucks of 1250 and 750 gpm capacity. A connection existed on the outside of the 2000 gpm diesel driven fire pump building for connecting a fire truck to the 300,000 gallon bladder. Connections at the outside of the 2000 gpm diesel drive fire pump building and a fire hydrant near the east gate portal provided a means to connect hoses to tie the outside loop to the inside loop as a backup supply of water.

The inspector noted during the tour that the 2500 gpm diesel driven fire pump building had signs stating that smoking was not allowed within 50 feet. Signs were not observed on the outside of the building at 1500 gpm pump. No other concerns were identified. The inspector concluded that the facility has the capability to supply a backup supply of water if required by TS 3.11.B.

b. Final Event Report on Bent Unit 2 Refueling Platform Boom

The inspector reviewed the final event report 90-002, concerning the Unit 2 refueling platform boom. This event occurred while defueling Unit 2 and delayed the offload for approximately three days. On January 9, 1990, at 4:10 p.m., while moving the refuel bridge across the SFSP, the fuel grapple came in contact with a blade guide handle and the boom was bent.

The root cause of this event was that no procedural guidance or training existed which specified minimum grapple height for traversing the SFSP with an unloaded grapple or for moving the grapple in more than one dimension at a time. Possible contributing factors were an undocumented modification which may have resulted in unreliable depth indications, and a blade guide which may not have been fully seated in its storage location.

The inspector noted that the defueling activities were carried out in a controlled and methodical manner. The final report was thorough and critical to point out the procedural and training inadequacies.



c. Failure to Follow Procedure

On March 1, 1990, the Unit 3 RPS Bus 3A was deenergized during manual transfer of 480 Volt Shutdown Board 3A from the associated alternate power source to the normal power source. This resulted in unplanned automatic initiation of all three Standby Gas Treatment System trains and both Control Room Emergency Ventilation trains. Additionally, isolations were received on the Unit 3 Reactor Zone Ventilation System; Refuel Zone Ventilation Systems for all three units; and Unit 3 PCIS Groups 2,3,6 and 8.

480 volt Shutdown Board 3A had been aligned to the alternate power source due to planned preventive maintenance activities associated with the 3A DG and the 4160 volt and 480 volt circuit breakers that provide normal electrical power to that bus. When the operator attempted to transfer the power source back to the normal supply power, the shutdown board was lost due to the 4 KV feeder breaker to the normal supply breaker being open. During the licensee's post event evaluation it was determined that the licensee's configuration control records did not reflect the fact that the breaker was out of position, a condition that could have been a contributing factor to the event. However, 0-01-57B, 480V/240V AC Electrical System Operating Instructions, Step 8.6.3, clearly requires that the normal feeder breaker AC Volts indicate greater than 450 volts prior to transferring the board power supply. The transfer activities were being directed by a Senior Reactor Operator licensed ASOS and performed by an electrically qualified assistant unit operator. Additionally, the voltage indication for the electrical power sources are located on 480 Volt Shutdown Board 3A and are easily within view of the individuals making the transfer.

This failure to follow procedure does not meet the requirements to qualify as a NCV due to poor performance in the area of failure to follow procedures. Therefore, this violation will not be considered a NCV. Similar events described in Unit 2 LERs 88-04, 88-07, and 89-05 are associated with personnel error or failure to follow procedures that resulted in unplanned ESF actuations or scrams. Unit 2 LER 88-08 was very similar in that an unplanned ESF actuation occurred when electrical power to the 2B 480 volt Shutdown Board was lost during transfer due to an open 4160 volt normal supply breaker being open. During the inspectors review of licensee corrective actions associated with this item as documented in IR 89-27, it was noted that the licensee had taken action to prevent recurrence including:

Individual counseling of operations personnel involved in the event focusing on the necessity for strict attention to detail when performing assigned tasks.

Since a contributing factor in this event was a test procedure which did not include adequate specific instructions, PORC members and alternates were provided guidance to ensure that procedures included adequate direction for returning systems to normal upon completion of the test.

This failure was identified as a violation of TS 6.8.1.1.a (Violation 259, 260, 296/90-05-03, Failure to Follow Operating Instruction).

d. Unit Status

All three units remain defueled and in an extended outage as part of the BFNPP recovery plans. Work activities for returning Unit 2 to service substantially increased near the end of this report period. The main activities were completion of pipe support and restraints.

6. Modifications (50090, 51063)

a. Workplan Review

The inspector reviewed the following completed workplans which were stored in plant lifetime storage.

WP 2600-89 involved the replacement of relays in RPS Circuit Protector Cabinets 2C1 and 2C2. This work was classified safety-related but not affecting EQ components. No problems were identified with the workplan.

WP 2588-89 involved the installation of EQ terminal blocks in MOVs 2-FCV-74-106 and 2-FCV-75-39 and the deletion of unused terminal blocks in MOVs 2-FCV-74-71 and 2-FCV-75-30.

During the review of WP 2588-89 the inspector noted that the workplan included the requirement to use only Marathon 300 terminal blocks or a qualified splice to replace existing terminal blocks. The work was properly documented on a Form 235 in accordance with SDSP 7.7, Qualification Maintenance Data Sheets (QMDS) Implementation and Harsh Equipment Maintenance System.

The inspector also noted that revision 1 to this WP added additional steps 31.0 through 34.0 which removed/replaced jumpers associated with 2-FCV-75-39 which were too short or cut. This replacement was performed in accordance with MAI - 3.3, Attachment 5, Cable/Wire Lift Data Sheet. The inspector reviewed MAI 3.3, Cable Termination and Splice for Cables Rated up to 15,000 Volts, Rev. 5, which was in effect at the time of the above work and determined that Attachment 7, Internal Panel Wire/Jumper Data Sheet, should have been used rather than Attachment 5 for this work. Attachment 7 included



the provision for recording new wiring type, Mark Number, and reel number and the performance of point to point continuity checks. These were not included on Attachment 5.

The inspector held discussions with members of the licensee Quality Organization to discuss the above deficiency. After performing a separate review of the subject workplan the quality organization representative acknowledged that the incorrect attachment was used during performance of the workplan. However, during the licensee's subsequent review of the workplan, the licensee Quality Evaluator identified that the missing items not documented by an Attachment 7 were actually performed by separate activities documented in the workplan. The inspector noted that the licensee performed EMI - 18, Limitorque Switch Adjustment for High Speed CSSC & Non-CSSC Valves, as post-maintenance testing.

As the result of the inspectors concerns in this area the licensee's Quality Organization initiated a special Quality Monitoring Report in this area which selected for review a minimum of six to eight workplans that were performed in the same period to determine if this was a generic problem. Each of the associated workplans used the correct attachment.

The inspector concurred with the licensee's position that the above inadequate work instruction constituted an isolated case and a minor deficiency with no safety significance.

b. Field Activities - Pipe Supports and Restraints Systems

1) Pipe Supports EECW System

The inspector observed the activities associated with pipe supports for the EECW, RHR and Core Spray Systems. The inspector noted that for the EECW system approximately 40 DCNs, 83 WPs and 750 supports were involved with the overall modifications effort in this area. The total amount of time dedicated by the licensee for this work was approximately three months. The following specific activities were reviewed:

- The EECW pipe support activities in the Unit 1 area involving the north header of EECW.
- The EECW pipe support activities in the Unit 2 area involving the north and south headers of EECW.
- The EECW pipe support activities in the Unit 3 area involving the south header of EECW.

The inspector noted that all activities observed were in accordance with applicable WPs and QC inspector activities were present.



An inspection was performed of the licensee's Warehouse No. 14, where pipe support material was staged. A significant amount of rust was observed on some of the support material dedicated to specific support activities in the field. This observation was discussed with senior TVA management and TVA QA supervisors.

2) Pipe Supports - RHR System

The inspector reviewed ECN/DCNs involving pipe supports on the RHR systems. A total of 34 ECN/DCNs were identified as being field complete, in progress, or in review status. The inspector reviewed DCN numbers W8850A and W9364A. The following was observed:

- |            |   |
|------------|---|
| DCN W8850A | Involved the installation, removal or modification of nine pipe supports located in Unit 1 on RHR Loop II.  |
| DCN W9364A | This modification involved seismically qualifying the RHR system of Unit 1 Loop II. In order to limit the amount of seismically qualified piping and associated supports, this modification adds blind flanges to the RHR system cross-tie piping at column R4. This DCN provides for the installation of blind flanges, and a vent line with associated isolation valves on the Unit 1 RHR system cross-tie line. This is a modification to the Unit 1 RHR system to support Unit 2 operation. |

The inspector walked down the areas where the pipe support activities are scheduled to occur in the Unit 1 RHR room. The inspector noted no deficiencies in the areas reviewed.

c. Electrical Signal Cable Tracing

The licensee conducted electrical signal tracing on 13 cables as requested by the Electrical Issues Inspection Team and documented in IR 89-59. The methodology used by the licensee involved the issuance of 13 MRs, numbers 1024810 through 1024822 which designated the cables to be traced. The inspector reviewed the MRs as issued and observed activities in the field.

Although all MRs had not been closed out at the end of this reporting period, all activities observed appeared to be in keeping with the inspection team's request.

The specific field observation consisted of observing the licensee perform cable routing using procedure SEMI-62, Revision 2, Cable Route Verification. This activity consisted of using a RD 600 Radio



Detection device, set to beep on 8 kHz signal hooked up to a cable conductor and tracing the path of the cable using a hand held receiver.

d. ECN/DCN Review

The inspector reviewed ECNs/DCNs for the following programs.

1) Appendix R

The inspector reviewed four ECNs/DCNs P0882, 0879, 0819 and 5289. These resulted in the initiation of the following WPs: 0031-86, Install uninterruptable power supply panel for communications radio repeater F1; 0005-87, Install uninterruptable panel for communications radio repeater F2; 2139-87, Rework conduit, cables, and equipment at fire doors 485, 500, 510, 630, 642, and 654; 3013-81, Install additional emergency lighting units, raceway, supports and cables in Unit 3 reactor building, control bay and DG building; and 2012-86, Abandon cable 2ES22546-II and add cable 2ES202-IS2 for HPCI and ADS separation. During this Appendix R review the inspector was informed that the responsibility for Appendix R was being transferred to the system engineering group and specifically to the Acting Mechanical Test Supervisor. The inspector discussed the Appendix R General Requirement C.6 that fire detection and suppression systems shall be designed, installed, maintained, and tested by personnel properly qualified by experience and training in fire protection systems. This item is identified as IFI 259, 260, 296/90-05-04, Qualification of System Engineer to Maintain Fire Protection Systems.

2) Pipe Supports

The inspector reviewed DCNs W4582A, W4593A, W4599A and W4604A, which involved the installation of pipe supports in the EECW system. The inspector was able to use the DCNs to determine the locations of those supports to be installed as well as those supports scheduled to be modified or removed. The inspector noted that each support drawing in the DCNs contained the material required as well as the weld maps.

The inspector noted that each ECN/DCN reviewed contained enough information to write WPs.

The inspector noted during these reviews and observations that a large portion of the Appendix R modifications may not be closed out prior to the next Appendix R inspection. However, the majority of the modifications should be in the field work completed status.

No violations or deviations were identified in the modifications area.



## 7. Restart Test Program (99030B)

On March 1, 1990, the inspector attended a meeting of the Joint Test Group. The items of discussion were as follows:

- Approval of new JTG membership
- Approval of minutes from last meeting
- Review of TE-12 and TE-13 for 2-BFN-RTP-085, Control Rod Drive System
- Intent Change to 2-BFN-RTP-047, Turbine Generator Control System
- Review of 2-TI-186, Control Rod Drive System RTD/PA-085
- Review of 2-TI-183, Reactor water Cleanup System RTP/PA-069.

No problems were noted by the inspector during the meeting.

## 8. Action on Previous Inspection Findings (92701, 92702)

## a. (CLOSED) URI 259, 260, 296/88-02-03, Control of FSAR Updates

The annual FSAR update had been deficient in the past. This has resulted in a FSAR which cannot be relied upon for 10 CFR 50.59 purposes. The plant NSRB concluded that safety evaluations required by 10 CFR 50.59 must be only partially based upon the FSAR with supplemental validation required by the use of other licensing documents. The inspector reviewed the licensee's closure package for this URI. For long term corrective action, the licensee has initiated a FSAR Verification and Update Program. Under this program, the FSAR will be verified and updated with the results of the Design Baseline Verification Program. A temporary exemption from the requirements of 10 CFR 50.71(e) concerning the annual FSAR update was granted until July 22, 1990. As interim controls, the licensee has put in place programs and procedures to maintain a 10 CFR 50.59 library and a file of FSAR changes. Training was conducted concerning these issues. The inspector reviewed two training syllabi. Each pointed out that the FSAR must be supplemented by other information and that a review of the 10 CFR 50.59 library for information while performing safety evaluations and screening reviews.

Introduction to the SAR, EGT121.010, and Qualified 50.57 Preparer Training, IGT 024.003 were reviewed. Since a temporary exemption was granted for the update based on the controls the licensee has established, a violation of NRC requirements is not warranted. The FSAR will be reviewed as part of the normal FSAR update process in July 1990. This item is closed.

- b. (CLOSED) URI 259, 260, 296/88-24-02, High DG Control Cabinet Internal Temperature.

This URI concerned whether a 140 degree F temperature limit applied to the DG room ambient temperature or to the inside of the control cabinets near the electrical/electronic equipment. The DG vendor, Morrison-Knudson, stated that the maximum allowable ambient temperature limit for the panel was 140 degrees F, and the maximum localized air temperature limit inside the cabinet was 176 degrees F. A full load test was conducted at 2850 kw and all temperatures were below 140 degrees F except for two locations. The vendor recommended an additional test, and the shielding of one thermocouple from radiant heat sources. The additional test was performed on September 19, 1988. MR 859966 was written to connect the test equipment. The highest temperature recorded was 132 degrees F, which was below both temperature limits. The inspector reviewed the test results, vendor correspondence, and licensee closure package and concluded that this issue is resolved. This item is closed.

- c. (CLOSED) URI 260/89-20-06, Restriction of Untrained Personnel From Work Activities and URI 260/89-20-07, Possible Failure to Provide Training to QA, Radcon, and NE Personnel.

During an inspection conducted in the area of training of licensee personnel, an inspector identified that site modifications engineers had not completed the licensee's orientation phase training within the time limit established in the Nuclear Performance Plan. This resulted in the issuance of Deviation 260/89-20-05. The inspector further identified that the licensee's training organization had identified various non-modifications personnel who had not completed orientation phase training or retraining within the established time limit. These URIs were opened pending further review of licensee actions in this area.

The inspector reviewed various documentation and internal memorandums provided by the licensee during followup inspections in this area as described in IRs 89-61 and 90-03. Additionally, NCV 260/90-03-01 was issued for failure to correct a known condition adverse to quality related to this issue. In those followup inspections the NRC determined that the licensee had reaffirmed their position that any engineers, technical staff, or managers involved in the conduct of actions that affect nuclear safety would receive the technical staff and manager training. However, as of the close of those reporting periods, the licensee had not provided the inspector with documentation to indicate that an adequate licensee review had occurred to verify that untrained personnel were restricted from unreviewed work.

Subsequent to these inspections the inspector was provided additional documentation which is related to these items. The inspector determined that the licensee verified that for the referenced



personnel requiring training, several personnel are no longer employed and the remainder have either completed the training, received approved waivers or are scheduled to receive the training during the upcoming year. After additional review the inspector determined that the licensee's quality, technical staff and management organizations provided adequate controls to insure that work performed by individuals who have not yet met the requirements for performing unreviewed work is reviewed by qualified individuals. The inspectors will continue to monitor the licensee's activities in this area with further review associated with the completion of the required training as part of the followup to Deviation (260/89-20-05). URIs 260/89-20-06 and 260/89-20-07 are closed.

- d. (CLOSED) VIO 259, 260, 296/89-18-04, Failure to Provide Cross-Disciplinary Review of Procedures.

This violation was for failure to provide cross-disciplinary review of procedures as required by TS section 6.8.1.1.j and SDSP 7.4. The inspection reviewed the licensee's closure package and sampled several recently revised procedures. SDSP 7.4 was revised to include a comprehensive procedure verification review checklist. A letter was issued to all site employees on March 21, 1989, which discussed the requirements for cross disciplinary reviews and the violation. The inspector sampled several recently revised OIs concerning layout and cross disciplinary reviews included systems engineering and chemistry section. The corrective actions taken appropriately addressed the issue. This item is closed.

- e. (CLOSED) URI 260/89-20-08, Corrective Action for CAQR

This unresolved item questioned the closure of CAQR BFP 800695P issued on September 16, 1988, which identified the failure to provide orientation training for modification engineers. This CAQR was closed on March 20, 1989 based on the fact that training had been requested. Closure of CAQR BFP 800695P did not meet the requirements for closure specified in SDSP-3.13, Corrective Action, Attachment E. This SDSP states:

CAQRs to be dispositioned by providing training may be closed when the target audience specified in the corrective action has received the promised training. On occasion, closure based on training of 10 percent less than when a justification is provided on or referenced by the CAQR.

TVA's closure of the CAQR with greater than 10% of the orientation training incomplete is considered to be a violation of their procedure SDS-3.13.

After review by NRC management, it has been decided to not issue a violation for premature closure of the CAQR. The primary reasons are as follows:



- A deviation from a commitment in the TVA Nuclear Performance Plan, Volume 3 to provide orientation the training was issued as Deviation 260/89-20-05.
- The licensee's September 18, 1989 response to the deviation commits to providing the required training on a schedule satisfactory to the NRC. NRC will confirm that the training has been given in the follow-up and closure of Deviation 260/89-20-05.
- The CAQR and its closure have minor safety significance since, as documented in TVA's response to the above Deviation, the modifications personnel did not have responsibilities affecting day-to-day safe plant operations and their work was controlled by procedures requiring review and approval by other qualified individuals. The NRC has not identified problems that have occurred due to the delay in providing orientation training. (See paragraph 8.c of this report.)

This item is closed.

No violations or deviations were identified during the Followup of Open Inspection Items.

#### 9. Licensing Activities

The licensee has frequently asked for time extensions regarding responses to violations. A review was conducted of the licensee's response to NRC inspection report violations, required by the Notice of Violation to be submitted within 30 days of the date of the letter transmitting the notice. The following are examples of response times that exceeded 30 days:

<u>Report Number</u>	<u>Report Date</u>	<u>Response Date</u>	<u>Number of Days</u>
89-06	5/8/89	7/7/89	60
89-08	4/7/89	5/12/89	35
89-11	5/22/89	7/10/89	49
89-20	8/4/89	9/18/90	45
89-27	8/8/89	9/21/89	44
89-39	10/13/89	11/22/89	45
89-45	11/8/89	12/15/89	37
89-53	1/18/90	3/5/90	47

In each of the above examples a request for extension of the response time was made by TVA and granted by the NRC, however, the extension requests were frequently made near the end of the 30 day period. In the future the licensee is requested to notify the NRC of a response extension request in sufficient time, such that the resident staff can verify that good cause exists prior to granting an extension.



## 10. Exit Interview (30703)

The inspection scope and findings were summarized on March 16, 1990 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.

<u>Item</u>	<u>Description</u>
259, 260, 296/90-05-01	IFI, ECP Corrective Actions, paragraph 4.
259, 260, 296/90-05-02	VIO, Inadequate Compensatory Fire Protection Measures, paragraph 5.a.
259, 260, 296/90-05-03	VIO, Failure to Follow Operating Instruction, paragraph 5.c.
259, 260, 296/90-05-04	IFI, Qualification of System Engineer to Maintain Fire Protection Systems, paragraph 6.d(1).

## 11. Acronyms

ADS	Automatic Depressurization System
ASOS	Assistant Shift Operations Supervisor
BFNP	Browns Ferry Nuclear Plant
CATD	Corrective Action Tracking Document
CFR	Code of Federal Regulations
CSSC	Critical Structures Systems Components
DCN	Design Change Notice
DG	Diesel Generator
ECN	Engineering Change Notice
ECP	Employee Concerns Program
ECTG	Employee Concerns Task Group
EECW	Emergency Equipment Cooling Water
EGT	Employee General Training
EMI	Electrical Maintenance Instruction
EQ	Environmental Qualification
ESF	Engineered Safety Feature
FCV	Flow Control Valve
FPP	Fire Protection Procedure
FSAR	Final Safety Analysis Report
IFI	Inspector Followup Item
IGT	Individual and Group Training
IR	Inspection Report
JTG	Joint Test Group
KW	Kilowatt
KHz	Kilohertz
LCO	Limiting Condition for Operation



LER	Licensee Event Report
MAI	Modification/Additional Instruction
MMI	Mechanical Maintenance Instruction
MOV	Motor Operated Valve
MR	Maintenance Request
NCV	Non-Cited Violation
NE	Nuclear Engineering
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
NSRB	Nuclear Safety Review Board
OI	Operating Instruction
PA	Power Ascension
PCIS	Primary Containment Isolation System
PORC	Plant Operations Review Committee
PM	Preventive Maintenance
PMI	Plant Manager Instruction
PMT	Post Maintenance Testing
QA	Quality Assurance
QC	Quality Control
QMDS	Qualification Maintenance Data Sheets
RHR	Residual Heat Removal
RPM	Revolutions Per Minute
RPS	Reactor Protection System
RTP	Restart Test Program
SAR	Safety Analysis
SDSP	Site Directors Standard Practice
SFSP	Spent Fuel Storage Pool
SI	Surveillance Instruction
TACF	Temporary Alteration Change Form
TE	Test Exception
TI	Technical Instruction
TS	Technical Specification
TVA	Tennessee Valley Authority
URI	Unresolved Item
VIO	Violation
WP	Work Plan

