



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

Report Nos.: 50-259/90-31, 50-260/90-31, and 50-296/90-31

Licensee: Tennessee Valley Authority
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Chattanooga, TN 37402-2801

Docket Nos.: 50-259, 50-260, 50-296

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

Inspection Conducted: October 10-11, October 30 -
November 2, November 13-16, and
December 10-14, 1990

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Section 2, TVA Projects

SUMMARY

Scope:

This special inspection was performed to verify that the implementation of the corrective action program for employee concerns received into the Watts Bar Employee Concerns Special Program was adequate to support the start-up of Browns Ferry Unit 2.

Results:

Based on the employee concerns reviewed, the team concluded that the employee concerns contained in the Employee Concerns Special Program (ECSP) were being adequately resolved to support the restart of Unit 2. Five examples were found in the 21 Corrective Action Tracking Documents (CATDs) reviewed where the documentation in the ECSP closure folders did not adequately support resolution of the concern. (paragraphs 2.a.10, 2.b.2, 2.b.3, 2.6.4, and 2.b.5) The inspectors identified that the issues from these five examples were adequately addressed and resolved through other existing programs to support restart. However, for those five examples, the ECSP closure folders did not reflect the proper resolution. Restart determinations were generally adequate. All restart determination discrepancies identified by the inspectors were determined to involve items which were already complete.

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Some employee concerns were identified by the licensee as conditions adverse to quality (CAQ) which resulted in the issuance of CAQ documents. In reviewing the CAQ documents, a program weakness was identified in the licensee's Corrective Action Program regarding closure of CAQRs. Unlike the ECSP overview process which verified that the completed corrective actions resolved the concern, there is no similar requirement for closure of CAQRs. The review for closure of CAQRs only requires that the corrective actions be completed, but not that they resolved the CAQ. (paragraph 2.b.9)

One non-cited violation (NCV 50-259,260,296/90-31-01) was identified concerning failure to follow Office of Nuclear Power (ONP) Standard (STD) 3.1.1 during the independent review for closure of a Condition Adverse to Quality Report (CAQR). (paragraph 2.b.9)



REPORT DETAILS

1. Persons Contacted

Licensee Employees

- * P. Carrier, Licensing Manager
- * C. Elledge, Browns Ferry Employee Concerns Site Representative
- * L. Ellis, Manager Employee Concerns Special Program (ECSP)
 - T. Galbreth, TVA Employee Concerns Manager
- * C. Hsieh, Licensing Engineer
- * J. Ingwerson, Site Programs
- * L. Myers, Plant Manager
 - T. Whittle, ECSP
- * R. Young, Project Engineer
- O. Zeringue, Site Director

Other employees contacted included licensed operators, maintenance personnel, training personnel, quality assurance personnel, and engineers.

NRC Employees

- * W. Bearden, Resident Inspector
- C. Patterson, Restart Coordinator
- * Attended Exit Interview

2. Employee Concerns Special Program Implementation (TI 2515/74)

The licensee classified the employee concerns in the Employee Concerns Special Program (ECSP) into nine functional categories. These categories were further separated into 107 Subcategory Reports. About 700 of more than 5800 employee concerns in the ECSP were evaluated as potentially safety-related or safety significant to Browns Ferry. An NRC Safety Evaluation Report (SER) was issued on the programmatic aspects of the ECSP on October 6, 1987. An NRC SER which reviewed a sample of subcategory reports applicable to Browns Ferry Nuclear Plant (BFN) was issued May 31, 1990. The 1990 SER concluded, based on the corrective actions identified in the subcategory reports, that implementation of the ECSP program corrective actions would adequately resolve the employee concerns to support restart of Brown Ferry Unit 2.

Corrective Action Tracking Documents (CATDs) were used by the licensee to identify the corrective actions for the concerns evaluated in the ECSP subcategory reports. The CATD corrective actions were implemented through a corrective action plan (CAP) for each CATD. The licensee identified that all or portions of 137 CATDs were determined to require closure prior to Unit 2 restart.

The inspection was conducted in three parts. The first part sampled the implementation of corrective actions for restart CATDs associated with the May 31, 1990 SER. The second part sampled the implementation of



corrective actions for restart CATDs not associated with the May 31, 1990 SER. The third part reviewed the adequacy of the restart determinations which categorized CATDs into the restart and non-restart categories.

a. CATDS Associated with the May 31, 1990 SER

The licensee identified that 21 of the 137 restart CATDs were associated with the subcategory reports reviewed in the NRC SER issued May 31, 1990. The inspectors reviewed the restart portions of the completed corrective actions for 11 of the 21 CATDs associated with the subcategory reports reviewed in the SER to determine if the corrective action plans for the CATDs were properly implemented for Unit 2 restart. These reviews are discussed below.

1. 20407-BFN-01, Vendor Drawing Legibility

The concern was that the drawing restoration program had not been fully implemented. It further stated that the Site Directors Standard Procedure (SDSP) 2.5 had not been rewritten as a Project Instruction (PI) and TVA had advised that this PI would be issued by June 30, 1987.

The licensee's proposed corrective actions were to revise PI 87-48 and to continue the implementation of the drawing restoration program that was on-going at that time.

The NRC Maintenance Team Inspection documented in Inspection Report 50-259,260,296/89-56 performed an in-depth review of the maintenance program and its implementation at the Browns Ferry Nuclear Plant. The inspection reviewed the licensee's program for identifying, evaluating, and correcting drawing discrepancies as specified in PI 87-48, Revision 1, Revising and Controlling As-Constructed/Configuration Drawings; PI 88-07, Revision 5, System Plant Acceptance Evaluation; and PI 87-05, Revision 2, Processing Drawing Discrepancies. Based on that review, the inspection team concluded that the programs, if properly implemented would resolve the drawing discrepancies.

Based on the licensee's current implementation of the programs, the inspector determined that Primary and Critical Drawings, which included the Vendor Drawings, were being upgraded to an acceptable standard to support Unit 2 restart. The inspector reviewed randomly selected primary and electrical drawings that were upgraded and found them to be of acceptable quality. The corrective actions were properly implemented and the issue was resolved.

2. 21813-BFN-01, Drywell Purge Pipe Supports

The concern was that during a design basis accident, the drywell purge system pipe supports for the 18 inch piping do not provide sufficient clearances for the upward movement of the containment



and that the supports cause interference with the 2 inch drywell purge pipe. The corrective action was based on an analysis which was conducted for the NRC Bulletin 79-14 program. The analysis showed that supports H-87 for Unit 2 and H-33 for Unit 3 would fail during a Loss of Coolant Accident. With these supports removed, the piping was determined to be qualified for interim operation. The corrective action was to remove these supports. The inspector verified that these supports were removed. The corrective action was adequately implemented and resolved the concern.

3. 22800-BFN-01, Unistrut Clamp Tests

The concern was that TVA Singleton Lab test results used by TVA in design for P2558-20 and P2558-50 Unistrut clamps with loads applied in the direction parallel to the pipe axis were two to three times higher than the Unistrut Corporation test results. The corrective action involved reviews of unistrut applications after 1984 and review of calculations for the identified Unistruts. In addition, the results of the reviews were to be incorporated in the Browns Ferry Nuclear Plant (BFN) Pipe Support Handbook.

The inspector noted that a deviation was processed to conduct a drawing review instead of a walkdown to review unistrut applications. The inspector reviewed calculation CD-Q2000-883868 R1 and determined that the drawing review was conducted and appropriate calculations were revised. The inspector determined that CAQR BFP870105 (closed) covered the retorquing of bolts on supports where torque values were not specified on drawings. QIR CEB-87-099 Revision 4 was issued November 15, 1988 and incorporated the axial load allowable corrections. This QIR was issued to resolve the test discrepancies between TVA tests and vendor tests. Design Standard C1.6.14, Design of Unistrut and B-Line Clamps for Piping and Tubing, was issued on May 23, 1989 to govern the design of Unistrut and B-Line clamps used in support of piping and tubing. The BFN Pipe Support Design Handbook was revised to reference the Design Standard. The use of the corporate design standard approach rather than just incorporation for BFN was considered a strength. The corrective action was adequately implemented and resolved the concern.

4. 21804-BFN-01, Alternate Analysis Piping

The concern was that alternate analysis piping less than 2 1/2 inches in diameter lacked calculations to show they were qualified to code and lacked drawings to show locations and types of supports. In addition, piping once categorized as alternate analysis piping and later evaluated under the Long-Term Torus Integrity Program (LTTIP) may not be qualified to Browns Ferry licensing commitments. The corrective action



for piping less than 2 1/2 inches in diameter involved evaluation, qualification and documentation as part of the corrective action required by Significant Condition Report (SCR) BFNCEB8520. The corrective action for the LTTIP issue involved revision of Design Criteria BFN-50-C-7103 and review of LTTIP piping to identify cases that did not meet the requirements.

The inspector reviewed the applicable portions of the corrective actions for SCR BFNCEB8520. The inspector reviewed the Small Bore Piping Assessment Program final report dated June 22, 1990. The inspector noted that NRC Inspection Report 50-260/89-36 issued September 21, 1989 and NUREG 1232, Volume 3, Supplement 1 reviewed the small bore piping program and determined it was adequate. Inspection 50-260/89-36 reviewed a sample of the calculations from this program and determined they were adequate. Inspection 50-260/90-38 examined 13 pipe supports listed in the June 22, 1990 report, which were repaired or modified as part of that program, to determine the adequacy of the installations. No discrepancies were noted in that examination. The inspector observed that Design Criteria BFN-50-C-7103 Revision 3 was updated with a Design Input memorandum on May 10, 1990. The inspector reviewed a May 11, 1990 memorandum from J. Rupert to J. Hutson which identified the completion of revisions made to calculations for torus attached piping as a result of the changes made to Design Criteria BFN-50-C-7103. The corrective actions were adequately implemented and resolved the concern.

5. 23101-BFN-01, Fire Protection

The concern was that undersized distribution headers could result in flow restrictions. The CATD stated that Fire Protection System commitments in the Nuclear Performance Plan had not been completed (81, 82, 83). The corrective action was to complete the commitments prior to restart. Item 81 was to review all Fire Protection surveillance instructions for adequacy and compliance with technical specifications. NRC Fire Protection Inspection Report 50-259,260,296/90-06 issued April 3, 1990 documented the review of 13 surveillance instructions and found no discrepancies. Item 82 stated that all future modifications to the fire protection system would be in compliance with the National Fire Protection Association (NFPA) code or CMEB 9.5-1. The fire protection program implements this commitment and was reviewed by the NRC in SERs and NRC Inspection Reports 50-260/89-28 and 50-260/90-06, and determined to be adequate. Item 83 states that a plan for achieving compliance with the NFPA code will be submitted prior to Unit 2 restart and will include a schedule for planned modifications and justifications for any remaining deviations. NFPA code deviations along with a schedule were submitted to the NRC as stated in the May 31, 1990 SER. The corrective action for this CATD was adequately implemented and resolved the concern.



6. 23106-BFN-02, Fire Protection QA Requirements

The concern stated that there was no engineering document which clearly established for BFN the Quality Assurance (QA) requirements for fire protection systems. The corrective action involved identification of NRC commitments, review of procedures and documents for incorporation of commitments and consistency, incorporation of any unincorporated commitments, and revision of procedures to resolve conflicting or unclear requirements. The inspector verified that the corrective actions were accomplished.

The inspector reviewed the Unit 2 Q-List and determined that High Pressure Fire Protection (System 26) and CO2 Storage, Fire Detection, and Purge (System 39) were identified as limited QA systems because they contained some safety related components. Halon Fire Protection (System 41) was identified as not safety-related and contained no safety related components. The NRC Inspection documented in Inspection Report 50-259,260, 296/89-16 determined that the implementation of the Q-List was satisfactory. The inspector reviewed Design Standard DS-M17.3.2, Revision 1, Fire Protection Quality Assurance Program, issued May 2, 1989 which implemented the requirements of the Fire Protection Program. DS-M17.3.2 originally implemented the requirements of Office of Nuclear Power (ONP) Directive (DIR) -5.7B, Fire Protection Quality Assurance Plan which has since been superseded by ONP Standard (STD) 5.7.2, Revision 0, Fire Protection Quality Assurance, issued July 5, 1990. Because DS-M17.3.2 was not updated after ONP-STD-5.7.2 was issued, the inspector noted some minor differences between them. The implementation of the Q-List and the procedures identified above adequately identify the QA requirements for fire protection system components which resolved this concern.

7. 80202-BFN-01 and 02, Compression Fittings

Concern numbers XX-85050-001 and 003 address inadequate quality control applied to the installation of instrument tubing compression fittings at Sequoyah and Bellefonte. Subcategory Report 80200, Revision 6, Section 3.2.2 identified the issues as a lack of adequate procedures and lack of training for personnel involved in compression fitting installation and inspection. The specific cause was listed as a failure by Engineering and Construction to specify and provide adequate installation and inspection instructions, and adequate training of inspection and craft personnel. CATD 80202-BFN-02 addressed inadequate engineering specification of requirements and CATD 80202-BFN-01 addressed inadequate Quality Assurance controls.

The original corrective action plan identified the corrective actions for Conditions Adverse to Quality Report (CAQR) BFNP870306 (Unit 1), CAQRBFP870014 (Unit 2) and CAQRBFP870305 (Unit 3) as those necessary to resolve the concern. A sample of instrument tubing was to be walked down to verify adequacy of existing instrumentation tubing fittings. A Level II deviation was processed against the original CAP to eliminate the walkdown requirement. The reasoning was that any defective fittings would have already experienced gross leakage while in service and would have been repaired. This was based upon testing performed at the Singleton Materials Engineering Laboratory which concluded that gross leakage would be observed during the hydro if the coupling was installed in a manner that would lead to failure. Based upon the completed actions and the deviation, a partial closure for both CATDs was made for Unit 2 restart.

The inspector reviewed the closure packages, the SER, and the subcategory report associated with these packages. The inspector also reviewed Maintenance Instruction MMI-74, Replacement of Compression Fittings, Revision 4 dated June 28, 1989, which was a general revision. This document referred to General Construction Specification (G-Spec) G-29, Volume IV, Process Specification 3.M.13.1, Specification for Installation and Inspection of Compression Fitting Joints in Mechanical Tubing Systems. The inspector reviewed Revision 0, dated December 9, 1985, Addendum 1 through 5 (February 20, 1987) of the process specification. Engineering Requirements Specification ER-BFN-EEB-001, Revision 1, dated May 31, 1990 was reviewed. It contained requirements that G-29 was to be followed in addition to the restrictions added by paragraph 3.1.5.2 dealing with compression fittings. In addition, Maintenance Instruction MAI-4.4A, Revision 0, dated November 17, 1989 was reviewed. MAI-4.4A contained instructions for initial installation and referred to G-29 and ER-BFN-EEB-001. The inspector determined that the issues of the concern were adequately addressed in the installation instructions and the engineering and construction specifications.

The licensee told the inspector that Initial Tubing Fitting Class, MTS 128, was given to maintenance and modifications personnel to qualify them to perform compression fitting work. The training record was updated after completion of the class and was used to verify qualification prior to the assignment of work. Periodic retraining was not required as part of the program. A copy of MTS 128, Initial Tubing Fitting Training, Revision 1, dated May 1, 1990, was reviewed by the inspector. The course provided hands on experience to the craftsman on various types of compression fittings. The common failure modes identified in the Singleton Materials Engineering Laboratory report were reviewed in the lesson plan. This was accomplished by presenting good work practices and identifying practices which



should be avoided. The inspector reviewed the class attendance rosters and determined that over 170 people were qualified during the last two years.

The licensee told the inspector that Quality Control inspectors who inspect instrument line installation are required to complete qualification training consisting of over 70 hours of self study, classroom, and observation. This included a special four hour classroom course, QCI024.001, Tube Compression Fittings. The inspector reviewed the lesson plan for QCI024.001, which covered assembly of six brands of compression fittings. Quality Control inspectors are required to complete classroom training every three years and perform field inspection in compression fittings once each year to maintain their qualification.

The inspector determined that the current program was adequate to resolve the concerns for Unit 2 start-up. The inspector concurs that visual inspections of non-pressurized compression fittings would not significantly increase the chances of finding defective joints. Area walkdowns conducted by the operations staff during start-up should identify any gross leakage evident at that time.

8. 80203-BFN-01 Vendor Welds

This CATD was developed as a result of problems identified by Quality Assurance. Various vendor's products were required to have reinspection of their welds performed. A specific employee concern number was not identified.

Unsatisfactory vendor welds were identified for materials supplied by Julius Mock and Sons. Twenty four Critical Safety System Component (CSSC) doors at Browns Ferry were manufactured by this vendor. A deviation to the CAP reduced the inspection requirement from 100% inspection of all doors to 100% inspection for seven of twenty four doors. Defects identified in the inspection were analyzed and determined to be acceptable. Since all of the welds on the seven doors sampled were acceptable, additional inspections were not required and the CATD was closed.

The inspector reviewed the closure package, the SER, and the subcategory report. The inspector verified that the sample selected exceeded the sampling guidelines required by the Quality Control (QC) weld inspection program. The inspector determined that the CAP was properly implemented and the concerns resolved.



9. 30115-BFN-01 Equipment Identification

Concern number XX-85-102-005 dealt with hardware not being properly identified in the field. The original CAP described a walkdown program which generated maintenance requests to install component identification tags. In addition, the Master Equipment List effort identified misnumbered equipment on drawings and generated Drawing Discrepancies to correct the problem.

The inspector identified that the configuration control programs had changed since the CAP was issued in August of 1987 and that Level III deviations were processed for these changes. The inspector observed that the new procedures had tighter controls on the design verification walkdown and tagging processes. The final walkdowns were being accomplished in accordance with SDSP 12.7, System Preoperability Checklist (SPOC), Attachments A and E. Both attachments require that Operations Instruction Letter (OSIL) 64, System Preoperability Checklist Walkdowns, Attachment 1, be completed for the Operations Department walkdown and included verification of component labeling for all components of the system. Instead of processing a maintenance request to correct a labeling problem, the new program described in SDSP-12.6, Fabricating and Installing Plant Valve Component ID Tags and Labels, Revision 4, dated December 19, 1989, required that an SDSP-265 Labeling Request Form be processed. Drawing Discrepancies were still being used to correct incorrect drawing nomenclature.

The inspector reviewed the new program and conducted a general area walkdown in Unit 2 to assess the implementation. The implementation was adequate and has resolved the concern.

10. 30102-BFN-01 Diesel Reliability Issues

Employee Concern numbers WI-85-100-003, XX-85-122-008, XX-85-122-009, XX-85-122-010, and XX-85-323-001 addressed reliability concerns with the Diesel Generators. The concerns pertained to the high number of required diesel starts, the need for upgrading Diesel preventative maintenance, and the lack of vendor and utility interaction to identify possible reliability improvements.

The CAP stated that BFN met the requirements of NUREG/CR-0660 with the exception of the installation of air dryers in the air start system. The CAP further stated that technical specification changes had been submitted to implement the recommendations of Generic Letter 84-15, Proposed Staff Actions

to Improve and Maintain Diesel Generator Reliability, to eliminate unnecessary starts.

The inspector determined that the air dryers were installed, and that the technical specification change was issued. The inspector determined through an interview of the system engineer that a trending program existed and that the program showed an increase in diesel reliability since the start of the program. The system engineer stated that preventative maintenance was being conducted in accordance with the manufacturer's recommendations. Although the CAP did not address the concern related to vendor/user interaction, the system engineer indicated that vendor and utility interaction was occurring. In addition, the inspector observed that vendor information was received and tracked through the Nuclear Experience Review program. The inspector determined that the CAP was adequately implemented. However, the inspector was required to review additional site programs beyond the scope of the CAP to determine that the concerns were adequately resolved.

b. CATDs Not Associated with the May 31, 1990 SER

Eleven additional restart CATDs not associated with the subcategory reports identified in the SER were selected and reviewed to determine if the implementation of the corrective actions resolved the associated concerns. These reviews are discussed below.

1. 20601-BFN-01, Configuration Control of Control Room Drawings

The concern stated that a listing was not available for essential control drawings for Units 1, 2, and 3 that were required to be updated to support plant operation. The required corrective action involved issuance of "key plant drawings" as part of the output products from the baseline program.

The licensee's review of the issue determined that a Drawing Management System was in effect which contained approximately 22,000 BFN drawings that were all categorized "Primary," "Secondary," or "Critical" and designated "as-constructed," "as-designed," or "configuration controlled." The system further designated which drawings should be sent to the control room and elsewhere. Based on the reviewed Drawing Management System Program, the licensee determined that a listing of current drawings for each control room was complete and this item was closed for Unit 2 only. The item was to be included on the licensee's Tracking and Reporting of Open Items (TROI) for Units 1 and 3 since verification packages had not been completed for these two units. However, the inspector did note that the Design Baseline and Verification Program (DBVP) was included in the CATD closure package which specified that systems in Units 1

and 3 required to support Unit 2 operation were to be included in the prestart program.

A Special NRC Team inspection was conducted at BFN on May 22-26, 1989 and the findings were addressed in Inspection Report 50-259,260,296/89-17. The inspection included areas of the transitional design change program and engineering change notice close-out. Ten systems were selected to verify that a complete set of control room drawings existed, including flow, schematic, and single line electrical, and to verify that they were clear, legible and reflected the latest modifications to the systems. Only minor deviations were identified and were being corrected by engineering. The team concluded that there were no areas identified that would impact plant operations.

In addition to the baseline program, the licensee implemented a system evaluation program to insure that the required Unit 2 and applicable Units 1 and 3 drawings were updated prior to the Unit 2 restart.

Based on the inspector's review, it was determined that the corrective actions were acceptable and resolved the concern.

2. 203.03-BFN-01, Nuclear Experience Review (NER) Program

This CATD was generated to resolve the portions of concern WI-85-100-034W dealing with the NER program. The concern stated that there is no formal system to track and assign commitments for problems identified by the Institute of Nuclear Power Operations (INPO); there is poor tracking of Nuclear Regulatory Commission (NRC) experience information; and there are no forced interactions with other utilities for exchange of information. The corrective action for the CATD implemented corporate revisions to the NER program committed to in the Corporate Nuclear Performance Plan (CNPP). This was accomplished by incorporating the requirements of PMP 0601.01, Revision 0, Nuclear Experience Review, in Site Director Standard Practice (SDSP) 15.9, Revision 0, Nuclear Experience Review, and by superseding Standard Practice 21.17, Review, Reporting, and Feedback of Operating Experience Items. A TVA-wide data base tracking system for resolution of all NER items was developed as part of the CNPP actions and was implemented at BFN as part of the site procedure change. This data base provided TVA-wide access to all NER items.

ECSP investigation of TVA's participation in industry sponsored programs and forums revealed that 490 TVA employees were involved directly in industry activities such as professional society committees and industry organizations. No corrective action for this area was necessary.



The inspector reviewed PMP 0601.01, Revision 0 and determined that INPO documents and NRC experience items were required to be entered and tracked to the completion of corrective action by the NER data base. The inspector verified that Standard Practice 21.17 was superseded on April 6, 1987 and that SDSP 15.9, issued on May 6, 1987, implemented the requirements of PMP 0601.01. The inspector determined that PMP 0601.01 had been superseded by Office of Nuclear Power (ONP) Standards Manual (STD) -1.3.1, Managing the NER Program, which was implemented at BFN by SDSP 15.9 Revision 7, dated June 19, 1990. The inspector reviewed the NER database and determined that INPO, NRC, and vendor experience items were included and that the database was tracking the disposition of the items to conclusion. The current program was adequate to resolve this issue.

The inspector noted that there was an additional issue added to this concern in Subcategory Report 24500 under summary of issues. The issue was that there was poor feedback to Engineering of corrections for identified problems. This issue was not part of employee concern WI-85-100-034W and was not addressed in the ECSP investigation of the issues or in the CATD for BFN. The inspector was unable to determine if this item was an actual employee concern which was not addressed. The licensee investigated this item and told the inspector that it was added during the first revision to the subcategory report. No documentation existed that identified why it was added. However, the issue was addressed for Sequoyah. The licensee did not believe it needed to be added to the CATD or CAP for Browns Ferry. The inspector concurred.

3. 23801-BFN-06, Sidewall Bearing Pressure

This CATD was initiated to resolve a concern that potential for cable damage exists for cables pulled in overfilled raceways and cable tray penetrations. Damage will not be discovered until cables short out. The CATD stated that a sidewall bearing pressure program had not been completed for BFN as stated in the Corrective Action Plan (CAP) for CATD 10900-NPS-01. The corrective action for this BFN specific CATD referenced Significant Condition Report (SCR) BFNEEB8631 which completed a sidewall bearing pressure evaluation program. The corrective actions utilized BFN specific calculations and sidewall bearing pressure evaluation program data to suggest that BFN cable installations were adequate.

The inspector was aware that resolution of the cable pulling issue with the NRC involved additional testing of installed cable. Review of CATD 10900-NPS-01 in relation to Sequoyah showed that documents related to the additional testing, which were submitted to the NRC, (high-potential testing of worst-case cables) were included in the closure package. The CAP stated that the testing and analysis results had been submitted to the



NRC and that if any additional short or long term corrective actions were required, the CAP would be revised. However, the CAP for CATD 10900-NPS-01 was never updated to reflect the additional high-potential testing of installed cable required for resolution of the concern. In response to the inspector's concerns, the licensee intends to update the closed portion pertaining to Sequoyah and process a deviation to the CAP for Browns Ferry and Watts Bar to take credit for the completed corrective actions.

The inspector reviewed the closure of SCR BFNEEB8631 and associated calculations ED-Q2000-88107, Cable Pulling Tension and Conduit Fill, and ED-Q2000-88225, Cable Pulling Tension and Conduit Fill. These actions satisfied the requirements of the CATD and CAP but did not resolve the concern. The inspector determined that the additional corrective actions of the high-potential testing were adequate to resolve the concern.

4. R-81-04-YCN/NPS-01, Safety Review Requirements

This CATD was initiated to resolve a concern that minimum safety review requirements had not been established by the Nuclear Engineering Branch. The CAP for this issue was to clarify safety review requirements by issuance of Nuclear Engineering Procedure (NEP) 5.2, Review, and NEP-EB-25.4.6, Guidelines for Discretionary Safety Reviews. NEP 5.2 was issued July 1, 1986 and NEP-EB-25.4.6, Revision 1, was issued November 6, 1985. NEP-EB-25.4.6 was later replaced by NEP 5.2. NEP 5.2 implemented design review requirements but did not address the requirements for safety reviews as specified in 10 CFR 50.59. The inspector determined that NEP 5.2 did not fully address the concern and that the closure package was not adequate to fully resolve the concern.

The inspector determined that the ONP standard which implemented the requirements of 10 CFR 50.59 was ONP-STD-6.1.3, Revision 3, Safety Assessment/ Evaluation of Changes, Tests, and Experiments (10CFR50.59) issued October 1, 1990. This standard superseded PMP 0604.04 which was the previous 10 CFR 50.59 standard. SDSP 27.1, Revision 12, Safety Assessment/Evaluation of Changes, Tests, and Experiments issued October 29, 1990 implemented ONP-STD-6.1.3. The Nuclear Engineering Procedure which implemented ONP-STD-6.1.3 was NEP 6.6, Revision 2, 10 CFR 50.59 Safety Evaluations, issued August 31, 1989. The inspector reviewed these procedures and determined that they, along with NEP 5.2, adequately resolve this concern.

5. 237.01-BFN-05, Motor Operated Valve (MOV) Torque Switch Installed.

The concern as stated was "thermal overload bypass and indication problems involving Regulatory Guide 1.97." Per the



licensee's documentation, this information was received via anonymous letter and no additional information was presented as part of the initial concern.

Although Regulatory Guide (RG) 1.97 was referenced in the concern, the applicable reference as interpreted by the licensee's evaluation team was RG 1.106. This was because RG 1.97 dealt with instrumentation to assess the plant and environmental conditions during and following an accident, and RG 1.106 addressed thermal overload protection for motor operated valves.

During the licensee's review of the requirements specified for thermal overload protection of valves, two basic failure modes were identified which could prevent a valve from operating during a post accident situation. The first was that an overload switch could open the circuit and prevent valve motor operation. The second was that the opening of a torque switch could prevent valve motor operation.

The NRC issued Circular 81-13, Torque Switch Electrical Bypass Circuit For Safeguard Service Valve Motors, to address the need to bypass the torque switch on motor operated valves important to plant safety to ensure operation of the equipment.

To evaluate the licensee's efforts to address and close the torque switch bypass issue, the inspector reviewed a letter from the BFN Power Plant Superintendent to the Manager of Nuclear Production, dated February 9, 1983, titled NRC Circular No. 81-13 - Torque Switch Electrical Bypass Circuit For Safeguard Service Valve Motors - Unit 2, and reviewed the closure of NRC Circular 81-13 in NRC Inspection Report 50-259,260/85-09. The licensee determined that this item required no additional follow-up and closed the CATD based on implementation of the requirement as documented in the correspondence above. The licensee performed no further corrective action.

In reviewing the February 9, 1983 correspondence, the inspector observed that 6 valves were listed as being exempted from the torque switch evaluation. Further reviews determined that 3 of the 6 valves had safety functions that could be required to operate during an accident. The inspector considered that the torque switches should be evaluated to ensure that the valve operation was not prohibited by the switch. There was no documentation in the closure folder that the licensee had evaluated the 6 exempted valves prior to closure of the issue.

At the request of the inspector, Nuclear Engineering performed a review of the valves in question and furnished documented assurance that the torque switch circuits had been modified to incorporate the requirement and therefore posed no problem for plant restart. This issue was an additional example where the



CATD closure folder did not adequately address the closure of the concern.

6. 24105-BFN-01, NRC IE Bulletin 77-05

The concern indicated that TVA was not complying with a commitment to NRC made in the response to NRC IE Bulletin 77-05, Electrical Connector Assemblies. The commitment was to perform thermal and radiation aging tests to environmentally qualify installed electrical penetration assemblies (EPAs) within 90 days of the response date. It was noted that the response was dated December 7, 1977. This concern was submitted on April 30, 1987 and stated that the tests had not been completed at that time.

The proposed corrective action plan was to replace any safety-related EPAs manufactured by the Physical Science Corporation (PSC) prior to restart of Units 2 and 3 with environmentally qualified replacements. The EPAs manufactured by PSC were selected because they were the only ones installed that were found not to be environmentally qualified for the application. This corrective action was completed for Unit 2 per Engineering Change Notice (ECN) P-3180. The licensee's research indicated that Unit 1 did not have the PSC assemblies

The inspector verified that ECN P3180 was complete for Unit 2. The inspector determined that the corrective actions were adequately implemented and resolved the concern.

7. CATD 113.00-BFN-03, Concrete Anchor Bolt Problems

This CATD concerned the corrective action for Corrective Action Report (CAR) BFN-CAR-85-058. The CAR was written to identify and correct a generic problem with concrete anchor bolts. The CAR corrective action was to sample the population of 1/4 inch through 7/8 inch diameter anchors. The specific concern of this CATD was that 7/8 inch diameter anchors were not included in this sample. The proposed CAP was to sample the population of 7/8 inch diameter anchors and complete the sampling program (BFEP C2041).

The sampling program for the CAR was initiated at BFN to address the adequacy of existing concrete expansion shell anchor installations. The program included the random selection of a sample population that included a cross-section of mechanical equipment, electrical equipment, conduit, cable trays, miscellaneous steel, HVAC duct, and small bore Class I and Class II pipe supports. This population consisted of anchors that were not included in the NRC Bulletin 79-02 anchor population. The population size was selected using the

guidelines of the Weld Quality Sampling Program and was intended to provide adequate statistical evidence to evaluate the adequacy of all the categories included in this sample.

Project Instruction BFEP PI-86-01 Revision 0, dated January 23, 1986, and Revision 1 dated April 14, 1986, Selection of the Sample Population For The Concrete Expansion Shell Anchor Sampling Program, were originally utilized to address BFN-CAR-85-058. This procedure required sampling of bolt sizes 1/4 inch through 7/8 inch in diameter. However, no 7/8 inch diameter bolts were included in the sample.

On October 5, 1988, Project Instruction BFEP PI-86-01 was cancelled and the Electrical Power Research Institute (EPRI) Standard NP-5228, Seismic Verification of Nuclear Plant Equipment Anchorage, was incorporated in the General Design Criteria BFN-50-C07104 and was utilized for sampling of concrete expansions. NP-5228 was accepted by the NRC.

This sampling procedure defines the selection of sample population by categories (Mechanical, Electrical, HVAC, Pipe Supports, etc.), but does not require sampling of specific bolt diameters. This program concentrates on type of equipment, rather than on anchor bolt size.

Engineering confirmed that during the entire walkdown inspection no 7/8 inch diameter expansion bolts were found. The same conclusion was also stated in the walkdown discussion for CATD 10400-BFN-01. Furthermore, Engineering explained that a few 7/8 inch diameter anchors exist in the torus area, but these bolts are within the Bulletin 79-02 program and received 100 percent inspection. The inspector concluded that the population of 7/8 inch anchor available for inspection was zero and that the concern was resolved. The inspector noted that the closure folder for this CATD was disorganized and that the justification for the conclusion that no further inspection was necessary was not clearly stated.

8. 201.05-BFN-01, Open CCTS Items

This concern was that some BFN commitments designated as "complete" on the Corporate Commitment Tracking System (CCTS) were still considered to be "open" by the NRC. This issue was addressed in ECSP Subcategory Report 24500, Incorporation of Requirements, Commitments, and Experience in Design, Revision 4. The CAP for this concern was to acquire a copy of the NRC Open Items List (OIL) and correlate it with the TVA CCTS. There was also a commitment in the Nuclear Performance Plan (NPP), Volume 3 to review and resolve open NRC items necessary for start-up.



TVA issued procedures SDSP 15.6, Revision 3, Commitment Management and Tracking, and Compliance Section Instruction Letter (CSIL) Number 7, NRC Item Closure-Brown Folder, which addressed this concern. When TVA completed the action on an open item, that item was changed from "open" to "complete" on the CCTS. It was still open on the NRC OIL. When the NRC issued an inspection report which closed the item, TVA changed the CCTS from "complete" to "closed". The inspector reviewed the above procedures and found them acceptable. During the review of this CATD the inspector observed that commitment number 103-6 in Volume 3 of the Nuclear Performance Plan, listed on the CCTS as control number NC0860326129, was designated as complete. This commitment was to review and disposition all NRC open items required for restart and was identified as complete in 1988. The inspector pointed out to licensee management that this item may not have been properly designated on the CCTS since a number of NRC open restart items were not expected to be complete until just prior to Unit 2 restart. The licensee informed the inspector that this item would be reopened. The inspector determined that the corrective actions were adequately implemented and resolved the concern.

9. 30201-BFN-04 and 05, Raychem Cable Splice CATDs

There were five CATDs that involved Raychem and had similar specific examples. The inspector intended to review two closed restart Raychem CATDs, CATD 30201-BFN-04, Modifications Procedures, and CATD 30201-BFN-05, Maintenance Procedures. During the review of 04 it was noted that the closure of many of the specific concerns were based on the closure of that same specific concern in restart CATD 30201-BFN-02, Design Document Control, which was closed. Additionally, while reviewing specific issues in 02, 04, and 05, two other CATDs were referenced as the justifications for item closure. These additional CATDs were CATD 30201-BFN-01, Standard Drawings, and CATD 30201-BFN-03, Training, which were closed but were not designated as restart. CATD-01 pertained to control of design documents for Raychem and CATD-03 pertained to the training and qualification of craftsmen that applied the Raychem kits. The inspector reviewed all five during the inspection to adequately assess the implementation of 30201-BFN-04 and 05. The inspector questioned the use of non-restart CATDs as the basis for closure of restart CATDs. This appeared inconsistent in that an issue was addressed in two separate CATDs and was classified differently in relation to the restart criteria in each.

These CATDs were initiated to resolve concerns that inaccurate, misleading, or conflicting information on Raychem were contained



in the Standard Electrical Drawings, G-38 Construction Specification, Maintenance/Modification procedures, MTE-129 lesson plan, and vendor manual. The inspector reviewed the following documents to determine whether the concerns were resolved and to verify the resolution of the specific items within the series of CATDs.

- Raychem Vendor Manual, BFN-VTM-R098-0010, Revision 0
- General Construction Specification G-38 - Installing Insulated Cables Rated up to 15,000 Volts, Revision 9
- Standard Drawings SD-E12.5.1-1., -2, and -3, - Cable Splicing and Terminating
- Electrical Standard Drawing SD-E12.5.4 - CABLE: Termination of MV (5-15 kV) Insulated Cable
- Electrical Standard Drawing SD-E12.5.5-1 and -2 - CABLE: Termination of MV (5-15 kV) Insulated Cable to Equipment Furnished With Pigtail
- Electrical Standard Drawing SD-E12.5.6 - CABLE: Splicing 600V (or less) Insulated Cables
- Electrical Standard Drawing SD-E-12.5.7-1 and -2 - CABLE: Termination of 600V (or less) Insulated Cable to Equipment Furnished With Pigtail
- Electrical Standard Drawing SD-E12.5.8 - Cable Splicing and Terminating 600V (or less) Multiconductor Insulated Cable
- Electrical Standard Drawing SD-E12.5.9 - CABLE: Splicing of Installed Cables in Cable Trays
- Electrical Standard Drawing SD-E12.5.3 - CABLE: Splicing Medium Voltage (5-15kV) Insulated Conductors
- ECI-0-000-LUG003 - Electrical Corrective Instruction, Medium Voltage Termination on Equipment Furnished With Pigtails Terminated to an Online Termination Using Raychem Kits, Revision 7
- ECI-0-000-LUG001 - Lugging and Terminating of CSSC Low Level Voltage Power and Control Cables and Internal Panel Wiring in Harsh Environment, Revision 10
- ECI-0-000-LUG004 - Electrical Corrective Instruction Medium Voltage Termination on Equipment Furnished With Pigtails Terminated to a Sub Termination Using a Raychem Kit, Revision 8



- ECI-0-074-LUG001 - Terminating RHR Pump Motor Leads Using Raychem, Revision 5
- ECI-0-075-LUG001 - Terminating Core Spray Pump Motor Leads Using Raychem Kits, Revision 4
- BF EMI-58.3 - CSSC and non CSSC Singles/Multiconductor Cable Repair, Revision 4
- MAI-3.2 - Cable Pulling For Insulated Cables Rated Up to 15,000 Volts, Revision 9
- MAI-3.3 - Cable Terminating and Splicing For Cables Rated Up to 15,000 Volts, Revision 9
- ECI-0-000-SPL001 - Splicing of CSSC Low Level Voltage Power and Control Cables and Internal Panel Wiring in Harsh Environments, Revision 6
- Lesson Plan MTE-129, Maintenance Training Electrical - Cable Splicing and Termination

CATD 30201-BFN-01, Document Control of Standard Drawing

The CATD concerned missing or out of revision Standard Electrical Drawings in Trailer 16. The CAP called for physical custody and control of the Document Control Stations. Subsequently, SDSP 2.12, Controlling Documents, was issued which implemented administrative controls. The inspector reviewed several control stations for the referenced standard drawing and found them all accounted for and of current revision. The Document Control Group also performs at least a biannual audit of all controlled design documents. The inspector also reviewed the control of the Raychem vendor manual and found it acceptable although it had only been in effect since May 31, 1988. The concern was adequately addressed and resolved. This CATD was not classified by TVA as a restart CATD but was closed.

CATD 30201-BFN-02, Design Document Control Problems

The CATD contained 12 items that dealt mainly with the standard drawings and the vendor manual. The CAP addressed revisions to standard drawings and procedures to eliminate inconsistencies between them. Subsequently, several of the initial procedures were superseded and thus no longer were in use. The inspector reviewed the current procedures in place and determined that the original concern items were resolved.



During this review the inspector noted that General Construction Specification G-38, Revision 9, issued February 23, 1990, had 38 active Specification Revision Notices (SRN) outstanding, the last which was issued on October 28, 1990. The SRNs were as thick as the 178 page G-Spec. Nuclear Engineering Procedure 5.1, Design Output, section 5.3.3 requires that no more than six SRNs be outstanding for any given G-Spec. That requirement was added by Procedure Change Notice (PCN) 3 to Revision 2 which was issued July 30, 1990 and was effective 90 days after issuance (approximately October 30, 1990). The licensee pointed out that Section 2.4.1 of NEP 1.1, Control of Nuclear Engineering Procedures, revision 3, dated April 18, 1990 stated that backfitting to comply with NEP requirements was not required unless specifically directed by the NEP, revision, PCN, or by separate correspondence. The inspector concurs that the procedural requirements were met.

The inspector noted that PCN 3 identified that it was issued to implement part of the corrective action for CAQR KXF890001 R1. The inspector reviewed the CAQR and the associated corrective actions. The CAQR was written at Browns Ferry in December 1988 to document a problem with SRNs for G-38 in that the total number of SRNs and the changes to various sections resulted in confusion. The requirements of NEP 5.1 at that time allowed SRNs to be no older than one year old. A variance had been issued on May 11, 1988 for the electrical G-Spec (G-38, G-40, G-47, and G-70) which granted relief from the NEP 5.1 requirements. The CAQR was determined to be a QA programmatic deficiency. The inspector noted that the initial root cause analysis was rejected and that a July 3, 1989 version was accepted. The CAQR was revised on November 17, 1989 to incorporate additional corrective actions identified in the root cause analysis. The corrective actions were independently verified complete by the licensee and the CAQR closed on September 28, 1990.

The inspector reviewed the CAQR closure package and determined that the independent verification of corrective action completion included reviews of revisions to G-specs which were not approved and issued. Appendix H to Standard 3.1.1, Corrective Action, revision 0, lists the criteria for closure of Condition Adverse to Quality Reports. Item 2 of Appendix H states that CAQs to be resolved through issuance of new or revised procedures or design output documents may be closed when the affected procedures or design output documents have been approved and issued; and an acceptable date has been established and approved when full implementation shall be complete. The inspector determined that the independent review did not meet these



requirements in that G-40, revision 11 (issued November 30, 1990), G-38, revision 10 (issued November 30, 1990), and G-47, revision 3 (issued November 29, 1990) were not approved and issued until after the CAQR was closed. Licensee management discussed this problem with the independent reviewer. Although the independent reviewer had also reviewed the current revisions he had not properly documented the review on the independent review sheet. The independent reviewer understood the documentation problem and will amend the closure document to reflect the entire scope of what was reviewed. This is considered a violation of 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings for failure to follow procedures and is designated non-cited violation (NCV) 259,260, 296/90-31-01. This NRC identified violation is not being cited because the criteria specified in Section V.A. of the NRC Enforcement Policy were satisfied.

In reviewing STD 3.1.1, the inspector noted that closure of a CAQR does not require an evaluation of whether the corrective actions, as implemented, resolved the problem. The corrective actions are only evaluated on whether they are accomplished in accordance with the corrective action plan. 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, requires that problems be identified and corrected. Unlike the ECSP overview process which verified that the completed corrective actions resolved the concern, STD 3.1.1 does not require that the licensee determine whether the problem was corrected. This was considered a weakness in the corrective action program.

CATD 30201-BFN-03, Raychem Training

The CATD identified a number of items dealing with inconsistencies between standard drawings, the G-Spec, the vendor manual, and the lesson plan for MTE-129, Cable Splicing and Termination. Along with the various revisions already noted to the design control documents, the lesson plan for MTE-129 was revised. The inspector noted that training department procedures required that prior to teaching a class a technical review of the lesson plan must be made against all the current revisions of the various design documents. A computer list was maintained and used for work assignments of MTE-129 trained workers. Subcategory report 30200, Revision 2, page 23 states that all modification and maintenance personnel shall be trained by MTE-129 and retrained for any revision to any of these documents. The inspector found no retraining requirement in the CATD, CAP, or in the procedures. A worker trained in 1986 was fully qualified to do Raychem work despite the fact that all applicable procedures, standard drawings, the G-Spec, the vendor manual, and the MTE-129 training were revised several times since that date. The inspector was told that informal undocumented discussions were held on the revisions with the craftsmen by the foremen. The



inspector was concerned that not all individuals would receive the training on the revisions without a formal tracking system in place. The concerns of the CATD were resolved.

CATD 30201-BFN-04, Modifications Procedures

The CATD consisted of 12 items, many of which were closed by reference to items in CATDs 02 and 03. The CAP called for procedure, standard drawing, and MTE-129 training revisions to address this CATD. The inspector reviewed the specific items and current documentation. This concern was adequately resolved.

CATD 30201-BFN-05, Maintenance Procedures

This CATD was similar to 30201-BFN-04 except that it was for maintenance workers. Similarly, items were closed by reference. The inspector conducted the same verification review. In addition, the inspector observed the removal of an existing splice, the resplicing and application of a Raychem Kit to splice BFN-2-SPC-064-0946A for Rosemont transmitter 2-PT-64-160A. All documentation was in order. The craftsmen were on the qualified list. A QC inspector was present and made the required inspections. The job was performed in accordance with ECI-0-000-SPL001, Revision 6. This concern was adequately resolved.

c. Restart Determinations

The inspectors reviewed the adequacy of the licensee's restart determinations in relation to ECSP CATDs. The main purpose of the review was to determine if the restart criteria identified in the Browns Ferry Nuclear Performance Plan, Volume 3, Table IV-1, were properly applied to the ECSP CATDs. Twenty of the fifty-four CATDs designated by the licensee as open and non-restart were selected for review. In addition to the CATD description, the inspectors reviewed the associated issues provided in the ECSP subcategory reports, ECSP evaluation findings and proposed corrective actions, Corrective Action Plans (CAPs), licensee's line management responses, and the Restart Review Subcommittee actions which primarily consisted of CATD item check lists.

The open non-restart CATDs reviewed were:

- CATD 104.00-BFN-05, Various Embedded Plates
- CATD 104.00-BFN-06, Flexibility Analysis RHR R159
- CATD 204.05-BFN-02, Errors in Procurement Document
- CATD 209.01-BFN-02, CSSC List
- CATD 212.02-BFN-01, Drywell Purge System Support Interface



CATD 213.02-BFN-01, Discrepancies in FSAR Section 13.4
 CATD 213.02-BFN-02, Test Result Packages
 CATD 225.00-BFN-01, 1E Battery Tie-Downs
 CATD 225.00-BFN-02, 1E Battery Support Seismic Qualification
 CATD 225.00-BFN-03, Identification of Battery Systems
 CATD 228.00-BFN-02, Unistrut Clamps
 CATD 232.08-BFN-01, Pipe Wall Thickness Calculations
 CATD 238.01-BFN-02, Computerized Cable Programs
 CATD 239.00-BFN-08, Install Cut/Terminate Cable Records
 CATD 239.00-BFN-09, Cable Length Incorporation
 CATD 241.05-BFN-03, EQ Program Electrical Penetrations
 CATD 242.00-BFN-04, Cable Tray Classification Justification
 CATD 243.00-BFN-02, Diesel Generator Loading Description
 (FSAR)
 CATD 302.02-BFN-01, Shutdown Board Overvoltage Evaluations
 CATD 303.03-BFN-01, Target Rock Valve Procedure

In reviewing the ECSP subcategory reports, CATDs, and CAPs, the inspector found several documents that identified the need to complete certain corrective actions prior to unit restart although the associated CATDs were not included on the restart list. The ECSP had identified the same concern in March 1989, and requested the Site Programs Manager to provide technical justification for excluding the affected CATDs from the unit restart list. The inspectors were informed that the Restart Review Subcommittee (RRSC) made additional reviews of the open non-restart CATDs for restart determination. One review was conducted on January 24, 1989, in which the following eight CATDs were revised to restart status: 215.02-BFN-01, 215.06-BFN-01, 215.06-BFN-02, 228.00-BFN-06, 218.01-BFN-01, 228.00-BFN-04, 242.00-BFN-03, and 239.00-BFN-06. The inspector verified that the proper designation for these CATDs was entered into the restart CATD database listing.

Based on the inspector's sampling of open non-restart CATDs, the inspector concurred with most of the current RRSC designations for restart. However, the inspectors disagreed with the licensee on the following two open non-restart CATDs that should have been designated as partial restart: 212.02-BFN-01, Drywell Purge System Support Interference; and 225.00-BFN-01, Class 1E Battery Tie-Downs. During the review of these CATDs, the inspector noted that the corrective action for the portions in question were complete. The details of the review for the two CATDs in question are contained below.

In reviewing CATD 212.02-BFN-01, Drywell Purge System Support Interference, the inspector noted that there were two corrective actions associated with the issue of inadequate communications to the licensee's engineering organization during Bulletin 79-14 inspection walkdowns performed by the licensee. The basic findings were that a drywell purge system pipe support had inadequate clearances to accommodate a Design Basis Accident pipe movement, the drawing for that support was nonexistent, and the licensee's engineering organization was not informed of these findings. The proposed corrective actions addressed in the ECSP subcategory report 21200,



Table 3, were: (1) to delete (remove) Unit 2 support H87 and Unit 3 support H33, and (2) to complete the Bulletin 79-14 effort. The inspector found that item 1, which addressed the removal of the supports, was addressed in both CATD 212.02-BFN-01 (non-restart) and CATD 218.13-BFN-01 (restart). The portion of CATD 212.02-BFN-01 which addressed the removal of the supports referenced CATD 218.13-BFN-01, which was designated as restart and was closed. The inspector determined that this was inconsistent since the same item was designated as non-restart in one CATD and restart in another.

In reviewing CATD 225.00-BFN-01 concerning the adequacy of Class 1E battery supports for seismic conditions, the inspector noted certain corrective actions addressed in ECSP Subcategory Report 22500, Attachment B, and the associated CAPs. The licensee was to assess the need for providing vertical tie-downs for Class 1E batteries located in the Diesel Generator and Reactor Buildings. For the 1E batteries in the Diesel Generator (DG) building (250 Vdc Shutdown Board Battery Supply System for Unit 3 and 125 Vdc DG Battery Supply System for Units 1, 2, and 3) an evaluation was to be performed prior to restart of each unit. For the 1E batteries in the Reactor Building (250 Vdc Battery Supply System for Units 1, 2, and 3, and 250 vdc Shutdown Board Battery Supply System for Units 1 and 2) an evaluation was to be performed under the Unresolved Safety Issue (USI) A-46 program as a post-restart activity. NUREG-1232 Volume 3, Supplement 1, Safety Evaluation Report on TVA Browns Ferry Nuclear Performance Plan, dated October 1989, accepted the licensee's reasoning for classifying USI A-46 program as non-restart. However, the inspector questioned why the safety-related Reactor Building batteries were not also required prior to restart. The licensee told the inspector that the Diesel Generator Building battery supports were selected for analysis prior to restart because they were considered the worst case in relation to seismic response spectra. The analysis showed that tie downs were not needed to meet seismic restraint requirements. Since the Diesel Generator Building battery supports were considered worse case, the licensee stated that there was no reason to evaluate the Reactor Building batteries before restart.

Engineering completed the evaluation of the Diesel Generator and Shutdown Board 3EB battery racks for vertical tie-downs in September 1988 to complete the restart portion of CATD 225.00-BFN-01 identified in subcategory report 22500. However, the licensee's tracking system and RRSC checksheet indicated that the item was a non-restart item. This discrepancy was also addressed in several memos between the ECSP and the BFN site. When the RRSC was scheduled to re-review this CATD on January 24, 1989, the CATD was listed as closed. As a result, the RRSC did not perform the re-review. On April 20, 1989, the CATD was reopened because it had been improperly closed, but was never re-reviewed by RRSC. As a result of the inspector's questions, the RRSC re-reviewed the CATD on December 6, 1990 and provided adequate justification to designate the Diesel Generator portion as restart which was consistent with the words in the subcategory report.



The inspectors noted that the reason why some open CATDs which met the restart criteria were designated as non-restart was that the Unit 2 portion was either closed, or the CATD was not applicable to Unit 2, but did apply to the other units. For example, CATD 104.00-BFN-06 was a base plate flexibility concern on RHR support R159 for Unit 3. This was determined to be an isolated case caused by design error. CATD 241.05-BFN-03 addressed the concern that no Environmental Qualification program was developed for the Unit 1 and 3 electrical penetrations. CATD 232.08-BFN-01, concerning use of wrong formula for piping minimum wall thickness calculations, was reanalyzed for Unit 2 on a sampling basis, but was not yet performed for Units 1 and 3. The licensee was cognizant of the fact that certain open CATDs apply only to Units 1 and 3, and stated that all of the CATDs will be reviewed again for restart determination prior to the start-up of the other units.

The inspector's review of open non-restart CATDs indicated that some of the initial restart determinations were not valid. This was also confirmed by reviewing a number of memos from ECSP to the Browns Ferry site from early 1989 and by a review of the January 24, 1989 RRSC meeting summary. Of the 34 CATDs reevaluated in the January 24, 1989 RRSC meeting, 8 were reclassified as restart. In addition, CATDs that were already closed were not reevaluated by RRSC during that meeting even though they were on the agenda as having a questionable determination. CATDs 302.01-BFN-01, Raychem Drawings; and 302.01-BFN-03, Raychem Training which had already been identified by the inspectors in paragraph 2.b.9 above were closed non-restart CATDs that should have been designated as restart. The inspector reviewed six additional closed CATDs designated as non-restart which were selected by title. Two were identified that should have been designated as restart items. These were CATDs 104.00-BFN-01, Inadequate Minimum Spacing for Expansion Anchors; and 242.00-BFN-01, Cable Separation Issues which are described in detail below.

CATD 104.00-BFN-01 addressed the potential problem with inadequate minimum spacing criteria for installation of expansion anchors. The corrective action was completed and this CATD was categorized as non-restart. The ECSP subcategory report 10400 and the associated CAP for this CATD required an evaluation of the anchor safety factors under Nonconformance Report (NCR) GENQAB8203, Rev. 2, to be completed prior to Unit 2 restart. Corrective action was to sample 60 supports with G-32 anchor spacing violations. The RRSC checklist and recommendation showed that this CATD was dispositioned as a non-restart item because NCR GENQAB8203 was issued. The inspector concurred with the corrective actions, which were complete, but disagreed with RRSC's determination for this being a non-restart item because there was a potential for component support overstress when combined action of multiple attachments were considered which could impact the ability of the system to meet its safety function.

CATD 242.00-BFN-01 addressed the concerns of inadequate design criteria for separation of redundant vertical and horizontal



electrical cable trays running on different planes, and that no criteria could be found for separation of cables in free air except for those in the cable spreading room. The corrective action was completed and this item was categorized as non-restart. The ECSP subcategory report 24200 states that corrective action will be completed prior to restart of each unit. Although this CATD/CAP was closed, the inspector disagreed with RRSC's determination for being a non-restart item because it fit the licensee's NPP, Volume 3, cable installation issues review commitment.

A licensee representative who was a member of the RRSC explained to the inspector the type of information used as a basis for the initial restart determinations. The inspector was told that initial restart determinations were made based only on the issue because the corrective actions had not been approved at that time. In addition, the ECSP investigations and subcategory reports had not been completed or issued. Since the inspectors' reviews had the benefit of all the ECSP documented investigations and the approved corrective actions in relation to the concern, the inspectors were satisfied that differences noted were in most cases related to the overall scope of the corrective actions. During follow-up discussions with the licensee, the inspectors discussed the apparent reasons for the differences between the inspectors' determinations and the RRSC determinations. The inspectors pointed out that since additional information was now available, future RRSC determinations for Units 1 and 3 should be based on the current information.

The overall conclusion from this review was that the licensee had generally made adequate and acceptable restart determinations with respect to the open CATDs. However, there were two open non-restart CATDs that contained portions which should have been designated as restart. The corrective actions for the portions in question were complete. Unit 2 restart determinations were made based on the description of the issue which was the best available information at the time. If the licensee follows the same approach for Units 1 and 3, all available information will include the ECSP investigations and CAPs.

3. Exit Interview (30703)

The inspection scope and findings were summarized on December 14, 1990 with those persons identified in paragraph 1. The Team Leader described the areas inspected and discussed in detail the inspection findings listed below. The licensee acknowledged the inspection findings and did not identify as proprietary any of the material reviewed by the inspectors during the inspection. During the inspection period, frequent discussions were held with members of the licensee's staff concerning inspection findings.

Inspection Findings:

Based on the employee concerns reviewed, the team concluded that the employee concerns contained in the Employee Concerns Special Program (ECSP) were being adequately resolved to support the restart of Unit 2.



Five examples were found in the 21 Corrective Action Tracking Documents (CATDs) reviewed where the documentation in the ECSP closure folders did not adequately support resolution of the concern. (paragraphs 2.a.10, 2.b.2, 2.b.3, 2.b.4 and 2.b.5) The inspectors identified that the issues from these five examples were adequately addressed and resolved through other existing programs to support restart. However, for those five examples, the ECSP closure folders did not reflect the proper resolution. Restart determinations were generally adequate. All restart determination discrepancies identified were determined to involve items which were already completed.

Some employee concerns were identified by the licensee as conditions adverse to quality (CAQ) which resulted in the issuance of CAQ documents. In reviewing the CAQ documents, a program weakness was identified in the licensee's Corrective Action Program regarding closure of CAQRs. Unlike the ECSP overview process which verified that the completed corrective actions resolved the concern, there is no similar requirement for closure of CAQRs. The review for closure of CAQRs only requires that the corrective actions be completed, but not that they resolved the CAQ. (paragraph 2.b.9)

One non-cited violation (NCV 50-259,260,296/90-31-01) was identified concerning failure to follow Office of Nuclear Power (ONP) Standard (STD) 3.1.1 during the independent review for closure of a Condition Adverse to Quality Report (CAQR). (paragraph 2.b.9)

