

# UNITED STATES NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

#### SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

# SEVENTH ANNUAL REPORT ON ECSP CORRECTIVE ACTION PLANS DEVIATIONS

# TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3

## SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

#### WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2

## BELLEFONTE NUCLEAR PLANT, UNITS 1 AND 2

#### DOCKET NOS. 50-259, 50-260, 50-296, 50-327, 50-328, 50-390, 50-391

#### 50-438 AND 50-439

#### 1.0 INTRODUCTION

By letter dated March 30, 1995, the Tennessee Valley Authority (TVA) submitted its 7th Annual Report, for the period January 1, 1994 to December 31, 1994, on the implementation of corrective actions for the Employee Concerns Special Program (ECSP). This program came out of the identified employee concerns with TVA nuclear power plants in the early 1980's which resulted in all operating units shutting down in 1985. The corrective actions followed by this program involve concerns raised by TVA employees in the early 1980's.

Between January 1, 1994 to December 31, 1994, the ECSP closed out 25 corrective action tracking documents (CATDs), resulting in 1178 CATDs being closed by the end of 1994 out of a total of 1591 CATDs. During 1994, there were 254 corrective action plans (CAPs) that required a deviation from the originally approved corrective action: 52 were Level IIa, 37 were Level IIb, and 165 were Level III. This was for all the TVA nuclear plant sites: Bellefonte, Browns Ferry, Sequoyah, and Watts Bar.

A supplemental report was submitted by TVA in its letter dated October 31, 1994, and addressed deviations to CAPs for Watts Bar Unit 1 which were approved by TVA during the period January 1 to September 30, 1994. This report addressed 20 Level IIa, 24 Level IIb, and 0 level III deviations for Watts Bar. The deviations reported in the Seventh Annual Report are in addition to those discussed in the Supplement Report. In its letter dated May 17, 1995, the staff addressed this supplemental report.

The report in the TVA letter of March 30, 1995, discussed only the 45 Levels IIa and IIb deviations, that were not in the supplemental report, and these

ENCLOSURE

9510050227 950928 PDR ADOCK 05000259 PDR PDR are reviewed in Section III below. The Level III deviations were not reviewed because they are considered only minor corrections to CAPs and, thus, do not need to be reviewed. This is discussed in Section II below. However, inspections by the Commission of the ECSP review the adequacy of the CAPs and how they were implemented.

#### 2.0 BACKGROUND

The enclosure to the TVA letter of March 30, 1995, provides the background to the ECSP, the CAPs, and the deviations to the CAPs.

The staff accepted the ECSP process to deviate from a previous agreed upon corrective action plan in its letter of April 15, 1991, to TVA. On July 9, 1992, the staff accepted changes to the process, proposed by TVA, which divided Level II deviations into Levels IIa and IIb.

A review was done of the Supplemental Report of the ECSP Corrective Action Implementation for Watts Bar Unit 1 by the staff and documented in the May 11, 1995, memorandum to file. Previous reviews of the other deviation reports, the 1st through 6th Annual Reports, are listed in this document.

Deviations to previously approved CAPs are divided into three levels of importance (TVA Nuclear Power Standard STD-1.4.2, "Resolution and Closure of Employee Concerns Special Program Corrective Actions Tracking Documents," Revision 0, April 2, 1990):

Level I deviations are major changes whose implementation would (1) deviate from the Technical Specifications, design basis, or Final Safety Analysis Report, or (2) cause a reduction in safety margins

Level II deviations are changes whose implementation would (1) affect multiple plants, (2) affect a programmatic area of weakness, (3) deviate from the techniques or methods established by the commitments previously made, or (4) involve organizational changes that directly affect CAP closure.

Level III deviations are all other changes.

The Level II deviations were further divided, by the method of ECSP management approval of the deviation, into the following:

Level IIa deviations which must be approved by the Senior Management Review group,

Level IIb deviations which must be approved by the Manager, Concerns Resolution Staff,

which were approved by the staff in its letter of July 9, 1992.

Only the Level I deviations must be approved by the staff; however, the staff has audited the Level II deviations. The Level III deviations are consider

minor changes to the CAPs and are, therefore, only reviewed during inspections of the ECSP.

## 3.0 REVIEW

The following is an audit of the Level II deviations in TVA's letter of March 30, 1995, for the Sequoyah, Browns Ferry, Watts Bar, Bellefonte Nuclear Plants, and for the category of nonplant specific.

#### 3.1 Sequoyah Nuclear (SON) Plant

## <u>CATD 11103-SQN-02 (Level IIb Deviation) - DNE (Division of Nuclear</u> <u>Engineering) Disposition of the "As-Built" Snubbers by SQN Site Personnel Has</u> <u>Not Been Released</u>:

The CATD documented the issue that "as-built" of all 47A053 snubbers by site personnel has been sent to DNE for evaluation, but the DNE disposition of the "as-built" information has not been released. The revised CAP is to issue the calculations and drawings that qualify and document the actual configuration of the snubber supports that were originally installed using 47A053 typical drawings. All of the typical snubber supports that were not previously qualified and changed to engineered support numbers were qualified and given unique drawing numbers. The original CAP was for only safety-related snubbers and the 47A053 drawings were issued for only safety-related applications.

Therefore, there is no reduction in the scope of the previous CAP.

#### <u>CATD 22301-SQN-02 (Level IIa Deviation) - Lack of Specific Tightening</u> <u>Instructions for Instrument Line Clamps</u>

The CATD documented the lack of specific tightening instructions for the original installation of Unistruct bolts for instrument clamps. The previously approved CAP was based on the in-place torque program on unistrut type supports revealed that none of the unauthorized clamps showed up in the populations sampled and, therefore, there was a high probability that the unauthorized clamps were not used for Category I installations at Sequoyah.

The revised CAP included (1) the sampling and bolt-tightening program for rigorously and alternately analyzed piping, conduit, and tubing for the restart of Units 1 and 2 in 1988; (2) the inspection of 883 instrument lines in Units 1 and 2, required to detect, monitor, and/or mitigate Chapter 15 accidents, for proper bolt tightening; and (3) a program for all future installations, mcdifications, maintenance, and inspection of supports for instrument lines.

Therefore, there is no reduction in the scope of the previous CAP.

# CATD SWEC-SQN-13-01 (Level IIb Deviation) - Volume of Plant Leakage Require Full-Time Operations of Liquid Radwaste System

The original approved CAP was missing the required approval signature. The revised CAP does not change the original CAP.

Therefore, there is no reduction in the scope of the original CAP.

# 3.2 Browns Ferry Nuclear (BFN) Plant

Unit 2 restarted in May 1991 from its voluntary shutdown in 1985. Unit 3 is expected to restart late in 1995, this year. There is no schedule at this time to restart Unit 1.

# <u>CATD 10400-BFN-06 (Unit 3 only, Level IIa Deviation) - Baseplate Flexibility</u> <u>Analysis Critical to Residual Heat Removal (RHR)</u>

This CATD documented that the base plate flexibility analysis critical to RHR piping support R159 for Unit 3 was not considered in the calculation. The previously approved CAP stated that the remedial corrective action was to perform the appropriate flexible plate analysis for the support because this was an isolated case of designer error with no generic implications. To ensure that personnel are fully aware of flexible plate design requirements, a memorandum was distributed in 1987 with these requirements.

The revised CAP is that the base flexibility concern on RHR support R159 for Unit 3 is an isolated case caused by designer error. However, requirements for flexible plate analysis were issued in 1987 and are in the following TVA documents: "Civil Design Standards" and "Pipe Support Design Handbook."

Therefore, there is no reduction in the scope of the previous CAP.

<u>CATD 21502-BFN-01 (Units 1 and 3 only. Level IIa Deviation) - Cut Rebar</u> <u>Effects and Hanger Loads on Structures</u>

<u>CATD 21506-BFN-01 (Units 1 and 3 only. Level IIa Deviation) - Category I</u> <u>Concrete Instructions are not Available</u>

# <u>CATD 21506-BFN-02 (Units 1 and 3 only, Level IIa Deviation) - Written</u> <u>Procedure Combined with Cut Rebar Evaluation do not Exist</u>

These three CATDs documented the issue, for the three units, that (1) no assessment had been made for cut rebar effects, (2) hanger loads on structures have not been integrated with such assessments, (3) no documented procedures or programs are in place to ensure compliance with FSAR licensing commitments relative to control of cut rebar and hanger loads on structures, (4) design calculations were not available, and (5) written procedures for assessing cumulative effects of hanger loads and cut rebar did not exist.

The previously approved CAPs involved experienced engineers who will walk through the entire reactor building (not including the drywell) and look for sample concrete elements most highly stressed by attachment loads which will represent worst case conditions. This resulted in determining certain columns, walls, and slabs to be the most highly stressed for Unit 2.

These CATDs have been closed out for Unit 2, but not for Units 1 and 3.

The revised CAPs are only for Units 1 and 3, and will be based on the work done for Unit 2. They will have experienced engineers examine the same elements in Units 1 and 3 that were deemed to be the most highly stressed in Unit 2. If the numbers, size, and location of attachments are judged not to be more heavily loaded than the highly stressed elements for Unit 2, the Unit 2 evaluation will be the basis for the other Units. If they are judged to be more heavily loaded, further evaluation will be performed. This program will cover only Class 1 concrete elements. It may avoid a rewalk of the plant to determine the critical elements in Units 1 and 3.

Unit 2 is the common unit between the other units. It is similar to Units 1 and 3, and is the location/pathway for systems common to all three units. It should have the most attachments to its concrete elements and, therefore, the concrete verification results for Unit 2 should encompass the other units in terms of loading.

Therefore, there is no reduction in the margin of safety for the previous CAPs.

## CATD 22901-BFN-01 (Level IIb Deviation) - Hole Sizing Inaccuracies

This CATD, for Unit 1 only, documented that vendor's orifice hole sizing mechanisms included engineering design inaccuracies, that loop accuracy calculations did not then exist to account for these inaccuracies, and these calculations should be compared to the appropriate safety limits per design standard DS-E18.1.10. These calculations would be required for the orifices used for quantitative applications to assure correct operations.

The previously approved CAP was a TVA loop verification program to address engineering inaccuracies in the loop accuracy calculations and make the appropriate comparison to the safety limits, per DS-E18.1.10, before the restart of Unit 2.

The revised CAP will apply the minimum requirements in EEB-TI-28, "Setpoint Calculations," for the Unit 1 loop accuracy verification program before the restart of Unit 1. EEB-TI-28 assures setpoints are established and held within safety limits.

Therefore, there is no reduction in the margin of safety for the previous CAP.

#### <u>CATD 22902-BFN-01 (Level IIb Deviation) - Potentially Radioactive Panel Drains</u> Routed into Floor Drains Instead of into Closed Drainage Systems

This CATD documented that there were potentially radioactive panel drains routed into floor drains instead of into closed drainage systems. The changes to the previously approved CAP are the following:

- the Unit 3 non-regenerative HTX sampling station is routed to the equipment drain system in place of the floor drain system.
- Site Engineering will issue a Design Change Notice to field implement the proper drain system for Units 1 and 2.

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Both the floor drain and equipment drain systems are routed to the closed liquid radwaste system.

Therefore, there is no reduction in the scope of the previous CAP.

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# <u>CATD 80202-BFN-02 (Units 1 and 3 only. Level IIa Deviation) - Deficiencies in</u> <u>Compression Fittings</u>

This CATD documented that the BFN response to WBN NCR 6278 (Revision 1), that a training program was in place to train personnel on compression fitting installation, was insufficient and unacceptable. The BFN response did not address fittings that are not subjected to pressure tests but could see radioactive service.

The revised CAP is the same as the previously approved CAP except for the elimination of the walkdowns of a sample of instrument lines of Unit 3 (CAQRBFN870305) and Unit 1 (CAQRBFN870306). The walkdown of Unit 2 is not being eliminated.

The justification for eliminating the walkdowns for Units 1 and 3 are the following: improperly installed fittings will either show leakage or maintain an adequate seal; several years of operation identified no adverse conditions related to leakage of compression fittings; system testing will be conducted prior to restart of Units 3 and 1 to identify and correct any compression fittings that are leaking; and lines not subject to pressure tests are typically short lines that are normally isolated, do not see system pressure, and, for those lines that potentially contain radioactivity, will be operated by a technician who would see the leakage. This justification for revised CAPs was accepted for SQN and BFN Unit 2.

Therefore, there is no reduction in the margin of safety of the previous CAP.

# CATD SWEC-BFN-38-02 (Level IIb Deviation) - Design Error in Electrical Circuit

This CATD documented a design error discovered in the electrical circuit for two hand switches which allowed by-passing the interlock for drywell purging in the "run" mode of operation.

The deviation in the previously approved CAP is to obtain approval signatures for the CATD. The engineering change notice (ECN) for Unit 2 has been implemented; the ECN for Unit 1 and the design change notice (DCN) for Unit 3 have been cancelled. NRC closed out the design error in the hand-switches circuit by Inspection report 88-28 for Unit 1. New DCNs will be generated to correct the switch problems prior to the restart of Units 1 and 3.

Therefore, there is no reduction in the margin of safety of the previous CAP.

# CATD SWEC-BFN-60-02 (Level IIa Deviation) - Weakness in Maintenance Program

This CATD documented the 1985 SALP-identified weakness in the maintenance program. The enforcement history continued to reveal that maintenance

activities often exhibited evidence of missing or inadequate work plans and procedures.

The revised CAP is different from the previously approved CAP in that the plans and procedures will be upgraded prior to Unit 2 restart with the remainder completed in accordance with the following: procedures not identified as requiring development or upgrading, but which were not important to the restart and operation of BFN, will be revised and upgraded as part of the long-term program to develop and implement nuclear procedures system in the revised Corporate Nuclear Performance Plan (NC0860326018)

The upgrade of maintenance is being tracked as part of a larger scope NRC procedures upgrade commitment for BFN. The current CAP and the BFN commitment (NCO860326018) are very similar in scope and the addition of the CAP commitment to the BFN commitment will maintain consistency with the overall objectives of the latter commitment.

Therefore, there is no reduction in the scope of the previous CAP.

#### 3.3 Watts Bar Nuclear (WBN) Plant

There were 48 Level II deviations in 1994. Four such deviations were discussed in the Seventh Annual Report and 44 were addressed by TVA in the Supplement Report submitted on October 31, 1994 for Watts Bar.

#### <u>CATD 11200-WBN-05 (Level IIa Deviation) - Vague Labeling for Electrical OC</u> Vendor Wiring

This CATD documented the electrical QC vendor wiring inspection criteria for labeling was vague in that it requires the inspectors to interpret what was an appropriate label for a given termination. In addition, the existing criteria only covered wiring that was modified by TVA.

The previously approved CAP was to review the inspection criteria for vendor labeling of factory-wired panels to better clarify the criteria. The schedule for identifying the safety-related panels which would be inspected and to bring the as-designed drawings into agreement with the as-built drawings was to be proposed.

The revised CAP states that (1) TVA has no labeling requirements for vendor wired panels and (2) labeling requirements are provided in G-38, MAI 3.3, and design output documents. Based on this, no walkdowns (inspections) will be performed on vendor labeling and any labeling discrepancy will be handled in accordance with SSP 3.04 at the time of their discovery.

Because TVA does not have requirements for vendor labeling of factory-wired panels, no inspection of the labeling is required. TVA does have standards for quality of equipment purchased and which delineates the requirements for wiring drawings furnished as part of procurement which consists of a complete wire check to demonstrate accuracy and continuity of wiring in accordance with TVA-approved drawings. There are labeling requirements for modifications and maintenance of panels with TVA.

Labeling discrepancies inside vendor panels have been determined by TVA to be nondetrimental to the safe operation of the plant if left uncorrected; therefore, no inspections will be done to bring as-designed drawing into agreement with the as-built drawings. This is related to CATD 11200-WBN-06.

Therefore, there is no reduction in the scope of the previous CAP. Decisions identified in the original CAP were made in the deviations to that CAP. TVA labeling requirements are provided in G-38, MAI 3.3, and design output documents although it has no labeling requirements for vendor wired panels. Labeling discrepancy will be handled in accordance with SSP 3.04 at the time of their discovery.

#### <u>CATD 11200-WBN-06 (Level IIa Deviation) - Non-Inspection of Safety-Related</u> <u>Vendor Wired Panels</u>

This CATD documented the issue whether all safety-related vendor-wired panels were inspected or scheduled for inspection to ensure that vendor wiring is properly labelled.

The revised CAP is the same as the previously approved CAP in that labelling. discrepancies will be handled in accordance with SSP-3.04 at the time of discovery of the discrepancy.

Therefore, there is no reduction in the scope of the previous CAP.

#### <u>CATD 31309-WBN-06 (Level IIb Deviation) - Door Redesigned Without</u> <u>Consideration of Employee's Suggestion</u>

This CATD documented that the response to a employee suggestion indicated that an alternative design of door A57 which was an employee's suggestion would be considered if maintenance of the door became a problem; however, the door is being redesigned without consideration of the employee's suggestion.

The previously approved CAP addressed the employee's suggestion except for the elimination of the air pressure differential across the door. The CAP included a design study request (DSR) to investigate the changes required to eliminate or deal with the air pressure differential. The revised CAP addresses the missing required approval signatures in the previously approved CAP. The revised CAP does not change the previous CAP.

Therefore, there is no reduction in the scope of the previous CAP.

#### 3.4 Bellefonte Nuclear (BLN) Plant

There is no schedule to license Bellefonte for power operation.

# <u>CATD 80104-BLN-02 (Level IIa Deviation) - Missing Ultrasonic Test (UT)</u> Documentation

This CATD documented that the UT report required for BLN Certification of Material Substitution dated November 4, 1981, was missing. The certification required an UT per NB 2541 to upgrade an ASME Section III, Class 2, 1" 3000# plug, SA182/F304 material, heat BPC, contract 825673, P.O. 821616 to Class I application.

The history of work on this CATD has resulted in the following actions still to be completed at BFN:

- DNE to mitigate the missing UT report (FIR-BLP87C206).
- Replacement of the plug with a vendor qualified plug (CMR-2809).
- Evaluation of numerous procedural problems identified in the areas of material control (i.e., traceability, verification, and upgrading) and encompasses corrective action for the following eight BLN CATDs: 40700-BLN-04, -05, -06, -07; 80104-BLN-01; 80204-BLN-01 (the revised CAP discussed below); and 80154-BLN-01 and -02 (SCAR-BLP870365, originally CAQR-BLP870365).

These actions are the revised CAP.

Therefore, there is no reduction in the scope of the previous CAP.

#### <u>CATD 80204-BLN-01 (Level IIa Deviation) - Material Traceability Concerning</u> ASME Section III Class 3 Bolting

This CATD documented that note number 2 of Appendix A to the cification G-53 (TVA Corporate document) requires code traceability for ASFE bolting material with a nominal diameter greater than one inch. BNP Procedure QCP-6.19, Revision 3, dated August 1, 1985, Section 6.3.3.7.1 only required recording heat numbers of Class 1 and 2 bolting material and QCP-6.19 did not have the G-53 requirements for heat code traceability for ASME Class 3 bolting material.

As discussed in the Seventh Annual Report, the original CAP has evolved into a revised CAP with the following actions:

- G-53 revised to comply with the ASME Code because of numerous CATDs identifying noncompliance with the ASME Code.
- BLN will revise QCP-6.19 to comply with the new G-53 requirements.
- BLN will revise SCAR-BLP870365, which addresses procedural problems identified in the areas of material control (i.e., traceability, verification, and upgrading), to address the correct disposition of this revised CAP.

The staff concludes that the revised CAP addresses the issues in the CATD.

#### 3.5 Nonplant Specific CATDs

There were 19 Level II deviations completed in 1994. Five were discussed in the Seventh Annual Report and 14 were addressed by TVA in the Supplement Report submitted on October 31, 1994 for Watts Bar.

#### CATD 10900-MPS 05 (Level IIa Deviation) - Conduit Fill Program

This CATD documented that cable diameters used in the conduit fill program were not enditable. Because cable diameters measured at TVA's Singleton Labs established new average cable diameter values for use in the cable conduit and tray fill, each project must incorporate the new values into their fill program and determine if overfill has occurred. The CAP for this CATD involved both conduits and cable trays.

The revised CAP is different from the previously approved CAP in the following:

- Cable ampacity is no longer an issue because TVA's present method (DS-E12.6.3) to determine cable ampacity is based on the number of conductors in the conduit and not on the percent of fill.
- Calculations for cable minimum bend and training radius, and sidewall bearing pressure are calculated by the TVA On-Line Mark Number Database computer program instead of using Engineering Design standards (EDSs) DS-DE-E-12.1.13 and DS-E12.1.14.

The calculated sidewall bearing pressure will still be used to justify past cable installation practices.

The revision of the CAP is to use a computer code instead of the design standards to perform calculations for cable minimum bend and training radius, and sidewall bearing pressure. The methodology for the calculations remained the same. Cable ampacity is no longer an issue.

Therefore, there is no reduction in the scope of the previous CAP.

## <u>CATD 31212-NPS-01 (BFN only, Level IIa Deviation) - Patdown Search Function</u> <u>Acceptance Criteria</u>

This CATD documented that acceptance criteria for patdown searches has not been adequately adhered to by PSS officers, during periods of inoperative electronic search equipment.

This has been implemented at all of the sites except Browns Ferry. The revised CAP is, therefore, only for Browns Ferry. The ECSP is taking credit for the approved security plan for Browns Ferry to address this issue for Browns Ferry. Patdowns are part of an approved security program.

Therefore, there is no reduction in the margin of safety of the previous CAP.

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#### CATD 80204-NPS-01 (Level IIa Deviation) - Adverse Trends

This CATD documented that Section 2.16, Revision 3, Paragraph 16.2 of TVA quality assurance manual, NQAM Part I, states that CAQRs must be initiated when adverse trends are confirmed; however, although negative trends were recognized during the course of implementing the Trend Analysis Program, no CAQRs have been written because a specific definition of "adverse" did not exist. The time frame of this is the 1980's. WBN site personnel requested a DNQA to address this issue and this CATD was issued to promote and track a revision to Section 2.16 and site implementing procedures.

The previously approved CAP acknowledged that TVA was not prepared to provide a quantifiable definition of "adverse trend"; however, an approach was to be developed by October 5, 1987. This CAP was revised because it did not provide an accurate corrective action plan to resolve the CATD.

The revised CAP states that TVA Nuclear Standard 3.4, Revision 5, Section 5.0, defines an adverse trend and the definition has been incorporated into Site Specific Procedure (SSP) 3.04 at all the TVA nuclear plant sites.

Therefore, the revised CAP addresses the CATD.

#### 3.6 Conclusions

The staff's review of the revised ECSP CAPs for 1994 was of the TVA reports submitted in letters of October 31, 1994, and March 30, 1995. The October 31. 1994, letter submitted the supplemental report and the March 30, 1995, letter submitted the Seventh Annual Report. The staff's review of the Supplemental report is discussed in its letter of May 17, 1995, to TVA and in the memorandum to file of May 11, 1995.

The staff review of the Seventh Annual Report was an audit of about half of the CAP deviations addressed in the report and is discussed above. Based on this review, the staff has no disagreement with the deviations identified and discussed in the Seventh Annual Report; however, inspections by the Commission of the ECSP will review the adequacy of the CAPs and how they were implemented.

Principal reviewer: Jack Donohew

Date: September 28, 1995