

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

5N 1578 Lookout Place

MAY 23 1988

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of)	Docket Nos. 50-259
Tennessee Valley Authority)	50-260
)	50-296

BROWNS FERRY NUCLEAR PLANT (BFN) UNITS 1, 2, AND 3 - NRC INSPECTION REPORT NOS. 50-259/88-04, 50-260/88-04, AND 50-296/88-04, - RESPONSE TO NOTICE OF VIOLATION

This letter is to provide TVA's response to your letter from K. P. Barr to S. A. White dated March 24, 1988, which transmitted the subject report. The report cited TVA with two violations.

Enclosure 1 provides background information and TVA's response to the violations. A list of commitments is provided in enclosure 2. An extension of the response due date until May 20, 1988, was agreed to by A. Ignatonis in a conversation on May 5, 1988.

If you have any questions, please telephone Clark Madden at (205) 729-2049.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. Gridley
 R. Gridley, Director
 Nuclear Licensing and
 Regulatory Affairs

Enclosures
cc: See page 2

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U.S. Nuclear Regulatory Commission

MAY 23 1988

cc (Enclosures):

Mr. K. P. Barr, Acting Assistant Director
for Inspection Programs
TVA Projects Division
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Mr. G. G. Zech, Assistant Director
for Projects
TVA Projects Division
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

Browns Ferry Resident Inspector
Browns Ferry Nuclear Plant
Route 12, Box 637
Athens, Alabama 35611

ENCLOSURE 1

RESPONSE
NRC INSPECTION REPORT
NOS. 50-259/88-04, 50-260/88-04, and 50-296/88-04
LETTER FROM K. P. BARR TO S. A. WHITE
DATED MARCH 24, 1988

Violation A

10 CFR 50 Appendix B, Criterion II requires that measures shall be established to assure the design basis for those structures, systems, and components to which Appendix B applies are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, the design basis for Class I buried piping, at penetrations into secondary containment and at entry points into the intake structure as described in Appendix C, Section C.2.a of the FSAR, was not correctly translated into specifications and drawings. This design basis specified that the analyses of the piping must be primarily concerned with differential movement at supports near entry points into structures. Hanger M-30, which provides the only axial restraint for residual heat removal service water (RHRSW) and emergency equipment cooling water (EECW) piping at the intake structure, was underdesigned and could not withstand the required thrust loading based on a recent analysis by the licensee. The analysis concluded that the hanger would bend and deflect out of position during a seismic event. This condition could allow a nearby flexible coupling to part potentially resulting in a loss of the RHRSW and EECW systems.

This is a Level IV violation and is applicable to all three units.

TVA Response

1. Admission or Denial of the Alleged Violation

TVA admits the violation.

2. Reasons For the Violation if Admitted

The root cause of the violation was a failure to clearly document the design basis of flexible couplings used for Class I piping. Drawings did not accurately depict the as-designed or as-installed configuration of the couplings, and specifications were not available to clearly describe the design and installation requirements. This is an example of a previously recognized weakness in design control at BFN which has been documented in Volume 3 of the Nuclear Performance Plan. If the specific problem had not been identified due to modification of the installed coupling configuration and subsequent failure of a required hydrostatic pressure test, the problem would have been identified and corrected by the piping stress analysis portion of the 79-14 program.

While it is not obvious that the installed configurations of couplings, shear pins, and tie-rod harnesses would meet code allowables, an evaluation has shown that the integrity of the RHRSW and EECW systems would have been maintained during a seismic event and safe operation was not compromised.

Although this evaluation was made without performing specific calculations, it is our judgement that the coupling design is governed by the hydrostatic test pressure, which was a required test before start-up of the plant.

Background

Dresser couplings are flexible compression fittings which have been extensively used in the process, water, and waste water industries since the late 1800's. Design of piping systems with Dresser couplings must account for the hydrostatic pressure which exerts an axial load across the coupling. The axial load may be taken by axially restraining the piping, by installing a tie-rod harness or shear pin across the coupling, or by burying the pipe. The tie-rod harness, while restraining the coupling axially, allows for rotation at the joint.

The EECW and RHRSW piping drawings at penetrations into the secondary containment and at entry points into the intake structure were issued in 1968. The 1968 drawings and subsequent revisions did not clearly depict the installed configuration of the couplings. In addition, specifications which provide the design requirements are not available.

In October 1986, an informal DNE evaluation erroneously concluded that tie-rod harnesses installed on couplings at the intake structure were not required because the piping was adequately restrained. The M-30 hanger was designed to provide seismic support for the piping. However, M-30 was not designed to restrain the system axial pressure thrust load applied to the hanger with the tie-rod harness removed.

Based on the erroneous evaluation, the ASME XI Hydrostatic Pressure Test was performed without the tie-rod harness installed. The coupling leaked excessively, which caused initiation of CAQR-871126 in December 1987 and a further evaluation. Had clear design drawings and specifications been available, the error which led to removal of the tie-rod harness would not have occurred.

3. Corrective Steps Which Have Been Taken and Results Achieved

Consistent with the commitments in Volume 3 of the Nuclear Performance Plan for BFN, programs were established to resolve past deficiencies which led to inadequately documented or analyzed designs.

The requirements for these programs, as set forth in Nuclear Engineering Procedures (NEP), were developed and issued. In addition to the NEP's, BFN has issued project instructions which augment the requirements of the NEP's.

Actions taken which specifically relate to the RHRSW and EECW system include the replacement of couplings at the intake pump station on the pump discharge piping with hard pipe and support modifications. This replacement work does not contradict our earlier statement that the affected system's integrity would have been maintained during a seismic event. Based on an evaluation, it was decided to upgrade the design at the intake pumping station by replacing the couplings rather than to expend the engineering manhours necessary to qualify the couplings for this application. With support modifications, the C EECW Pump discharge line in RHRSW tunnel 3B/3D has been qualified with coupling and tie-rods in place to meet interim operability requirements. We have replaced couplings on the D EECW pump discharge in tunnel 3B/3D with hard pipe and support modifications to meet code compliance.

4. Corrective Steps Which Will Be Taken to Avoid Further Violations

A section will be provided in the "Rigorous Analysis Handbook" to establish a guideline for the design and analysis of flexible joints, and a clarifying statement will be provided in the design criteria BFN-50-C-7103 that establishes requirements for the analysis of flexible joints.

In conjunction with the 79-14 program, TVA will evaluate and modify, as required, the class I piping with dresser couplings, including the remaining piping and supports in the RHRSW tunnels, and the couplings that are buried just outside the unit 1 and 2 diesel generator building. The evaluation which determines the extent of the condition will be documented.

The remaining evaluations referenced above and the final design will be issued by June 24, 1988. Any identified modifications specifically required for unit 2 fuel load will be completed by September 1, 1988. Modifications for unit 1 and 3 will be performed before their respective restart.

A revision to the FSAR will be needed to reflect the results of the analysis and modifications and will be incorporated into the 1989 FSAR update.

5. Date When Full Compliance Will Be Achieved

Modifications required for unit 2 fuel load will be complete by September 1, 1988. Due to the FSAR update, full compliance for unit 2 will be achieved by July 22, 1989. The modifications and FSAR revisions for units 1 and 3 will be completed before fuel load of those units.

Violation B

10 CFR 50 Appendix B, Criterion V requires that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Standard Practice 8.3, Plant Modifications, Section 11.2, Work Control, states that when a workplan requires equipment to be removed from service, Section XI of the Workplan Control Form (Form BF-62) shall be signed by the Shift Engineer or Operations Supervisor. Part III, Section 4.1, of the Nuclear Quality Assurance Manual (NQAM) states in paragraph 6.1.1 that written instructions that cover Quality Assurance (QA) records preparation shall include requirements to ensure that QA records are complete, legible, and in black ink or other permanent medium with the exception that some records may be prepared in a nonpermanent medium such as pencil, provided the document is converted to a permanent medium before final approval. In that case, the procedure shall ensure that the nonpermanent documents remain under the control and responsibility of the supervisor who gives final approval of the document.

Example 1

Standard Practice (SP) 8.3, Plant Modifications, Section 11.2, Work Control, was not adhered to for Workplan WP0017-86, Cable Pull and Camera Support for Permanent Power Installation, in that Section XI of Form BF-62 for WP0017-86 was not signed by anyone even though the modification involved taking security equipment out of service. Work commenced per the workplan in July 1987 and security camera was taken out of service in December 1987. The camera was returned to service on February 19, 1988, following the inspector's inquiry of the camera's operability status on February 15, 1988.

TVA Response

1. Admission or Denial of the Alleged Violation

BFN admits the violation.

2. Reasons For the Violation if Admitted

Two work plans were being worked simultaneously to complete the permanent power installation. WP0017-86 installed the permanent wiring for the security cameras while WP0018-86 disconnected the existing temporary power and terminated the new installed lines. If a work plan requires equipment to be removed from service, the work plan control form (BF-62) is required to be signed by the shift engineer or operations supervisor. The modifications foreman failed to have the shift engineer or operations supervisor sign the workplan as required by Standard Practice BF-8.3. This was an isolated case and one individual's error.

3. Corrective Steps Which Have Been Taken and Results Achieved

Cameras B and C were temporarily fed from the same breaker. In order to work on camera B, the breakers were de-energized long enough to lift the cable feeding camera B. After the above cable was lifted, the breaker was immediately turned on in order to return camera C to service. These actions were performed by a unit operator under direction of the shift engineer which did not necessitate placement of a "hold tag." Even though it did not violate a clearance procedure, it would have been prudent for the shift engineer to properly tag the breaker. A Condition Adverse to Quality Report (CAQR) was written to document failure of the modifications foreman to have the shift engineer sign the work plan as required by procedure. As part of the corrective actions, the work plan control form BF-62 was signed by the shift engineer. Since this was an isolated case and the individual who failed to follow procedure has permanently left TVA, no further actions are required.

4. Corrective Steps Which Will Be Taken to Avoid Further Violations

None

5. Date When Full Compliance Will Be Achieved

Full compliance has been achieved.

Example 2

SP 12.24, Conduct of Operations, was inadequate in that it does not fully adhere to the requirements stated in Part III, Section 4.1 of the NQAM, paragraph 6.1.1. SP 12.24 allows the use of uncontrolled "scratch pads" in the preparation of QA records. Section 5.4.2 of SP 12.24 encouraged operators to use "scratch pads" to maintain records of out-of-service equipment and return to service for subsequent entry into the operating logs. These scratch pads may be destroyed after use. No control measures over the nonpermanent scratch pads were contained in SP 12.24.

TVA Response

1. Admission or Denial of the Alleged Violation

TVA admits to the violation as stated. The correct procedure title is Browns Ferry Standard Practice (BF)-12.24.

2. Reasons For the Violation if Admitted

We have reviewed section 5.4.2 of BF-12.24, Conduct of Operations, and agree that the procedure step does not fully adhere to the requirements stated in Part III, Section 4.1, paragraph 6.1.1.4 of the NQAM.

The NQAM states in part that ". . . documents prepared in a nonpermanent medium may receive final approval signatures before conversion to a permanent medium (e.g., photocopy of microfilm) as long as the organization preparing such documents establishes procedures requiring conversion of the document to a permanent medium immediately after the approval signature is applied. The permanent medium copy will be considered the QA record. The procedures shall also ensure that the nonpermanent documents remain under the control and responsibility of the supervisor who gives final approval of the documents." Contrary to this, Standard Practice BF 12.24 did not require operator scratch pads to remain under the control and responsibility of the supervisor before placing the information into the permanent log book.

3. Corrective Steps Which Have Been Taken and Results Achieved

A permanent change has been made to Standard Practice BF-12.24 to ensure section 5.4.2 fully adheres to NQAM Part III, Section 4.1, paragraph 6.1.1.4 by deleting the use of scratch pads. Therefore, the procedure no longer encourages using "scratch pads" in preparation of QA records. Formal logs are to be maintained during the shift.

4. Corrective Steps Which Will Be Taken to Avoid Further Violations

None

5. Date When Full Compliance Will Be Achieved

Full compliance has been achieved.

ENCLOSURE 2

RESPONSE
NRC INSPECTION REPORT
NOS. 50-259/88-04, 50-260/88-04, and 50-296/88-04
LETTER FROM K. P. BARR TO S. A. WHITE
DATED MARCH 24, 1988

LIST OF COMMITMENTS

Violation A

1. A revision to the FSAR will be processed to reflect the results of the analysis and modifications by July 22, 1989.
2. A section will be provided in the "Rigorous Analysis Handbook: to establish a guideline for the design and analysis of flexible joints, and a clarifying statement will be provided in the design criteria BFN-50-C-7103 that establishes requirements for the analysis of flexible joints. The handbook and design criteria revisions will be accomplished by June 24, 1988.
3. In conjunction with the 79-14 program, TVA will evaluate and modify, as required the class I piping with dresser couplings including the remaining piping and supports in the RHRSW tunnels, and the couplings that are buried just outside the unit 1 and 2 diesel generator building. The evaluation which determines the extent of the condition will be documented. The remaining evaluations and final design will be issued by June 24, 1988. The identified modifications specifically required for unit 2 restart will be completed by September 1, 1988.
4. Modifications and FSAR revisions for unit 1 and 3 will be performed before their respective fuel loads.

Violation B - Example 1

Full compliance has been achieved.

Violation B - Example 2

Full compliance has been achieved.