TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

August 17, 1983

USNRC REGION II
ATLANTA, GEORGIA
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U.S. Nuclear Regulatory Commission
Region II
ATTN: James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

Enclosed is our response to your July 13, 1983 letter to H. G. Parris transmitting Inspection Report Nos. 50-259/83-18, -260/83-18, -296/83-18 regarding activities at our Browns Ferry Nuclear Plant which appeared to have been in violation of NRC regulations. We have enclosed our response to Appendix A, Notice of Violation and the additional information you requested.

In your letter, you indicated "that the next refueling, scheduled for September 1983 will not commence without concurrence from this office." Our understanding is that this is in reference to the unit 1 core reload which is tentatively scheduled to begin September 15, 1983. This reload will be placed in hold until we receive your concurrence. Please inform us of your position in this regard as soon as possible so that we can avoid impacting the unit 1 outage critical path.

Mike Hellums of my staff and Ross Butcher of your staff discussed on August 12, 1983 an extension of our submittal to August 17, 1983.

If you have any questions, please call Jim Domer at FTS 858-2725.

To the best of my knowledge, I declare the statements contained herein are complete and true.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills

L. M. Mills, Manager
Nuclear Licensing

Enclosure

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RESPONSE - NRC INSPECTION REPORT NOS.
50-259/83-18, 50-260/83-18, AND 50-296/83-18
J. P. O'REILLY'S LETTER TO H. G. PARRIS
DATED JULY 13, 1983

Appendix A

Item A - (259/83-18-01)

10 CFR 50, Appendix B, Criterion V requires activities affecting quality be prescribed by documented instructions, procedures or drawings and include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Licensee Amendment Number 42 authorizes the increased fuel storage in accordance with the licensee application dated December 2, 1977, as supplemented by letters dated December 20, 1977, May 24, May 26, June 30, August 2, August 10, and September 1, 1978. The licensee's application commits to verifying at the reactor storage pool site, by use of a neutron source and neutron detectors prior to use, that a K effective of the spent fuel high density storage rack shall be less than or equal to 0.95.

1. Contrary to the above, this requirement was not met in that TI-14, Special Nuclear Materials Control and Accountability System, did not require that the acceptance criterion of certification of fuel storage racks be verified prior to use.

2. Also, the requirement for conformance with the license application was not met in that on April 24, 1983, 130 fuel bundles were loaded into high density fuel rack #8 (per drawing C5445-E-102) in the Unit 1 fuel pool prior to conducting the required testing.

This is a Severity Level IV Violation (Supplement 1) applicable to Unit 1.

1. Admission or Denial of the Alleged Violation

   TVA admits that the violation occurred as stated.

2. Reasons for the Violation if Admitted

   Management controls for the handling and movement of spent fuel were inadequate in that:

   a. There were no provisions tying the installation modification procedure and the fuel-handling procedure (TI-14) together;

   b. there were no provisions for TI-14 to be updated as new high density fuel storage racks were installed; and

   c. there were no provisions for second-party technical review at the nuclear engineer level to verify the exact sequence of fuel moves.

3. Corrective Steps Which Have Been Taken and the Results Achieved

The status of all fuel racks in the unit 1 spent fuel storage pool was verified from the workplan. A safety analysis was performed by the Reactor Engineering Branch (REB) to address the safety aspects of unloading fuel from the untested to a tested high density spent fuel storage rack (HDSFSR). Following receipt and PORC review of the completed safety analysis, the movement of fuel to a tested rack was completed.

The installation workplan was revised to include a signoff step for the nuclear engineer to update the tagboards in the control room and on the refuel floor whenever HDSFSRs are installed and tested. In addition, the installation workplan has also been revised to provide for updating TI-14 as fuel racks are installed and tested.

TI-14 was revised to include maps for each fuel pool showing the "tested" and "untested" status of each HDSFSR and to require the nuclear engineer to use the maps for preparation of fuel assembly transfer forms. A second-party verification step has been added to the fuel assembly transfer package to technically verify the sequence of fuel moves.

Before resumption of fuel off-loading activities, a meeting was held between the site and NCO management for the review of investigation findings and concurrence with appropriate corrective action. Also, Region II of the NRC was apprised of the initial findings and corrective action before the resumption of offloading activities.

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

No further corrective action is required.

5. Date When Full Compliance Will Be Achieved

Full compliance was achieved on June 23, 1983 when both the necessary procedure revisions and the analyses and movement of fuel to tested racks were completed.

Item B - (259, 260, 296/83-18-03)

10 CFR 50, Appendix B, Criterion XIV, as implemented by TVA Topical Report TR75-1, Section 17.2.14, requires that measures shall be established to indicate by the use of markings, such as tags, labels, or other suitable means, the status of inspections and tests performed upon individual items of the nuclear power plant. These measures shall provide for the identification of items which have satisfactorily passed required inspections and tests, where necessary to preclude inadvertent bypassing of such inspections and tests.

Contrary to the above, this requirement was not met in that tag boards used on the refuel floor and in the control room during refueling operations were not marked to indicate that the eight high density fuel racks

installed in the Unit 1 fuel pool were unqualified (boral testing not done as required) for fuel storage. Unqualified high density fuel rack #8 (per drawing C5445-E-102) was used for fuel storage of 130 bundles on April 24, 1983. Additionally, no plant procedures identified the eight high density fuel racks as unqualified for fuel storage.

This is a Severity Level IV Violation (Supplement I) applicable to Units 1, 2, and 3.

1. Admission or Denial of the Alleged Violation

   TVA admits that eight fuel racks in the unit 1 spent fuel storage pool were not properly identified as not having post-installation boral verification. TVA also admits that this resulted in 130 fuel assemblies being stored in an untested rack.

2. Reasons for the Violation if Admitted

   Management controls for the handling and movement of spent fuel were inadequate in that:

   a. There were no provisions tying the installation modification procedure and the fuel handling procedure (TI-14) together;

   b. there were no provisions for TI-14 to be updated as new HDSFSRs were installed; and

   c. there were no provisions for second-party technical review at the nuclear engineer level to verify the exact sequence of fuel moves.

3. Corrective Steps Which Have Been Taken and the Results Achieved

   TVA's corrective action for this violation was the same as that detailed for violation A:

   a. The status of all fuel racks in the unit 1 spent storage pool was verified from the workplan.

   b. A safety analysis was performed to address the movement of fuel from untested to tested racks.

   c. After appropriate review and approval of the safety analysis, the movement of fuel from untested to tested racks was completed.

   d. The installation workplan and TI-14 were both revised to include the appropriate signoff steps for nuclear engineer verification of fuel moves and the "tested" status of each storage rack.

   e. TI-14 was further revised to include maps for each fuel pool showing the "tested" status of each HDSFSR, and requires the nuclear engineer to use these maps in preparing the fuel assembly transfer forms.

In addition to these corrective actions, the tagboards on the refuel floor and in the control room were marked up to identify any HDSFSRs that were installed but not tested (a red "X" was placed across the rack location). Also, as indicated in the response to violation A, Region II of the NRC was apprised of our initial findings and corrective action before fuel off-loading activities were resumed.

4. Corrective Steps Which Will Be Taken To Avoid Further Violation

No further corrective action is required.

5. Date When Full Compliance Will Be Achieved

Full compliance was achieved on June 23, 1983 when both the necessary procedural revisions and the analyses and movement of fuel to tested racks were completed.

Item C - (259, 260, 296/83-18-04)

10 CFR, Appendix B, Criterion II and the accepted QA program, Section 17.2.2, requires that a training and indoctrination program to assure that personnel responsible for performing quality affecting activities are instructed as to the purpose, scope, and implementation of the quality assurance program. The program shall provide for indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained.

Contrary to the above, this requirement was not met in that a review of QC inspector training and indoctrination as related to fuel handling operations determined that the training was inadequate. Two QC inspectors on April 22, 1983, incorrectly verified that nine fuel bundles were properly placed in the high density fuel rack. A survey of several QC inspectors' knowledge in this area indicated the majority (6 of 8) of QC inspectors were unable to properly determine fuel location requirements when given the location sequence as designated on the fuel transfer forms. Discussion with QC personnel indicated that the fuel transfer form data configuration was not presented during the formal class training for fuel handling certification. The QC inspectors are required to verify location and orientation of fuel bundles when moved from the core to the spent fuel pool as required by TI-14.

This is a Severity Level IV Violation (Supplement 1) applicable to units 1, 2, and 3.

1. Admission or Denial of the Alleged Violation

TVA admits the violation occurred as stated.

2. Reasons for the Violation if Admitted

The violation was caused by a combination of inadequate QC inspector training and inattention to detail on the part of the QC inspectors involved.

3. Corrective Steps Which Have Been Taken and the Results Achieved

No immediate corrective action was taken because fuel off-loading activities were completed by the time the QC inspector problem was brought to management attention.

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

Before the next major refueling operation, the following changes will be made to the QC inspector fuel-handling operations:

a. All QC inspectors will be required to undergo an upgraded fuel-handling class given by the Operations Section.

b. The QC fuel-handling certification program will undergo the following changes:

(1) The Browns Ferry Operations Section will train and administer a written test to the QC inspectors. The Operations Section will forward examination results to the Field Quality Engineering Section.

(2) The Field Quality Engineering Section Supervisor (or assistant) will review the examination results and sign the fuel transfer certification form attesting that the inspector successfully completed the necessary classroom training.

(3) On-the-job training will be provided by the Field Quality Engineering Supervisor (or assistant). This training will be under the guidance and direction of a certified fuel movement inspector (an experienced inspector recertified on fuel handling by additional written examination).

(4) After completion of the training, the certified inspector will sign the fuel transfer certification form attesting to the proficiency of the inspector being trained.

(5) After completion of the classroom and on-the-job training, the Field Quality Engineering Supervisor (or assistant) will verify visual acuity and sign the fuel transfer certification form. The inspector will be considered certified to independently perform fuel movement verifications when the Field Quality Engineering Supervisor (or assistant) signs the fuel transfer certification form certifying the inspector.

c. Before each major fuel movement operation, a briefing or orientation will be held by the Field Quality Engineering management with the Quality Control unit. This briefing will summarize the necessary steps in performing fuel movement verifications and stress attention to detail in every phase of the inspection.

5. Date When Full Compliance Will Be Achieved

Full compliance will be achieved before reload of the unit 1 reactor core (tentatively scheduled for September 15, 1983) when the revised and upgraded QC fuel-handling certification program is implemented.

Item D - (259/83-18-02)

Technical Specification 6.3.A.2 requires that detailed written procedures including applicable checkoff lists, covering refueling operations shall be adhered to.

Contrary to the above, this requirement was not met in that:

1. TI-14, attachment B1, Fuel Assembly Transfer Form, requires that the fuel handling operator sign for fuel movement, verification of location and orientation during inter-fuel-pool transfers. Nine bundles were transferred in accordance with Field Change 1 to the Unit 1 unload fuel transfer form on April 22, 1983, without proper verification signoffs, (steps 1-9).

2. A review of the official copy of the fuel assembly transfer form indicated that for steps 14-39 (the movement of 26 fuel bundles) no operator verification signoffs for fuel bundle location and orientation were completed.

3. The shift engineer is required to review completed fuel movement data sheets. No shift engineer review was indicated for the movement of bundles steps 14-26 on April 22, 1983.

4. TI-14 requires that fuel bundles be placed in the spent fuel pool in the specified sequence of row-rack-column for location purposes. Five different operators on nine different fuel movement operations placed fuel bundles in the wrong location in the Unit 1 spent fuel pool. The operators placed the fuel in rack-row-column sequence vice the procedural requirements.

5. Fuel movement operations from the Unit 1 core to the Unit 1 fuel pool require that the fuel handling operator signoff on the fuel transfer form to verify location and orientation of the fuel bundle moved. TI-14 requires a first party signoff be made by the fuel handling operator. During a review of the fuel transfer forms and discussions with plant personnel, the inspector noted that the operators do not sign off on the fuel transfer form as required by TI-14. Instead, the shift engineer initials for the operator on the fuel transfer form and then the shift engineer signs the form for overall shift engineer review. No indication is on the form to indicate the shift engineer was signing for the operator, i.e., "by", "for".

This is a Severity Level IV Violation (Supplement 1) applicable to unit 1.

Item D.1

1. Admission or Denial of the Alleged Violation

TVA admits that this portion of the violation occurred as stated.

2. Reasons for the Violation if Admitted

This portion of the violation was caused by a lack of operator attention to detail. The field change request (FCR) was written in by hand on the fuel assembly transfer form, and the form had already been signed off indicating that the fuel was in the prescribed location. When it was discovered that the fuel was actually in an incorrect location, it was moved to the correct location. However, the operator did not realize that in moving the fuel from the first location to the correct location, a second signoff was required.

3. Corrective Steps Which Have Been Taken and the Results Achieved

A corrective action report (CAR 83-101) was issued to provide documentation for the event. However, it was not possible to reverify that the fuel was at the prescribed location because the fuel had subsequently been moved to another location.

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

TI-14 will be revised to require that a FCR involving fuel movement be made on a separate field change sheet. In addition, this event and its consequences will be discussed in operator "fuel-handling" meetings and special emphasis will be placed on attention to detail in and the documentation of fuel-handling activities.

5. Date When Full Compliance Will Be Achieved

Full compliance will be achieved before the reload of the unit 1 reactor core (which is tentatively scheduled for September 15, 1983).

Item D.2

1. Admission or Denial of the Alleged Violation

TVA admits that this portion of the violation occurred as stated.

2. Reasons for the Violation if Admitted

This portion of the violation was caused by a lack of communication between the fuel-handling supervisor and the refuel floor operators.

A working copy of TI-14 was being used during the fuel movements. Operator signoffs on the working copy indicated the 26 fuel bundles had been properly made and the movements verified, but the data and operator signoffs were not transferred to the official copy of the TI-14 instruction.

3. Corrective Steps Which Have Been Taken and the Results Achieved

The fuel-handling supervisor was instructed to ensure that appropriate documentation is complete at the end of each shift. After these instructions were given, the fuel-handling supervisor then signed the official copy of the fuel assembly transfer form for the 26 fuel moves.

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

GOI 100-3 is being revised to clearly specify how the required signatures on the three copies of the fuel assembly transfer forms are to be handled. Also, this event and its consequences will be discussed in future operator "fuel-handling" meetings.

5. Date When Full Compliance Will Be Achieved

Full compliance will be achieved before the reload of the unit 1 reactor core (tentatively scheduled for September 15, 1983).

Item D.3

1. Admission or Denial of the Alleged Violation

TVA admits that this portion of the violation occurred as stated.

2. Reasons for the Violation if Admitted

The shift engineer did not sign the fuel movement data sheets because they were not complete. The nuclear engineers picked up the data sheets the following day without realizing that they had not been signed by the shift engineer.

3. Corrective Steps Which Have Been Taken and the Results Achieved

The shift engineer's signature was obtained for the movement of bundles for steps 14-26.

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

The nuclear engineer will be required to provide additional review of the fuel movement data sheets. GOI 100-3 is being revised to clearly specify how the required signatures on the data sheets are to be handled. In addition, this event and its consequences will be discussed in future operator "fuel-handling" meetings.

5. Date When Full Compliance Will Be Achieved

Full compliance will be achieved before the reload of the unit 1 reactor core (tentatively scheduled for September 15, 1983).

Item D.4

1. Admission or Denial of the Alleged Violation

TVA admits that this portion of the violation occurred as stated.

2. Reasons for the Violation if Admitted

The use of inexperienced operators in the fuel-handling crew and their unfamiliarity with the format of fuel movement sheets led to the fuel bundles being placed in the wrong location.

3. Corrective Steps Which Have Been Taken and the Results Achieved

The error was discovered by the operators involved and by the QC inspector immediately after the first fuel move was completed. The nine fuel assemblies were placed in the correct rack and subsequent fuel moves were made using the required "row-rack-column" format.

The fuel movement sheets (fuel assembly transfer forms) have been revised to specify the format to be followed at the top of each page.

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

This event and its consequences will be discussed in future operator "fuel-handling" meetings.

5. Date When Full Compliance Will Be Achieved

Full compliance will be achieved before the reload of the unit 1 reactor core (tentatively scheduled for September 15, 1983). The format of the fuel assembly transfer form of TI-14 was clarified on May 26, 1983.

Item D.5

1. Admission or Denial of the Alleged Violation

TVA admits that this portion of the violation occurred as stated.

2. Reasons for the Violation if Admitted

The procedural controls covering fuel-handling activities were inadequate in that they did not clearly specify how the different forms, data sheets, and instructions used in fuel-handling activities, were to be handled.

3. Corrective Steps Which Have Been Taken and the Results Achieved

Fuel-handling supervisors are instructed to ensure that the operators handling the fuel, at the end of each shift, sign off for the fuel moves on the official control room copy of the fuel movement sheets.

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

GOI 100-3 will be changed to specify how the required signatures for the working and official copies of fuel movement sheets are to be handled. Also, this event and its consequences will be discussed at future operator "fuel-handling" meetings.

5. Date When Full Compliance Will Be Achieved

Full compliance will be achieved before the reload of the unit 1 reactor core (tentatively scheduled for September 15, 1983).

Item E - (259/83-18-05)

T.S. 6.8.3 requires that a licensed senior operator be in direct charge of the reactor refueling operation.

Contrary to the above, two Senior Reactor Operators failed to detect the mislocation of fuel bundles in the fuel storage rack and numerous omissions of proper verification signoffs. This failure indicates a lack of control of the refueling operation.

This is a Severity Level IV Violation (Supplement 1) applicable to Unit 1.

1. Admission or Denial of the Alleged Violation

TVA admits that two senior reactor operators (SROs) failed to detect the mislocation of fuel bundles in the fuel storage rack. However, TVA does not agree that this is a violation of plant Technical Specification 6.8.3.

2. Reasons for the Violation if Admitted

The two SROs failed to detect the fuel mislocation due to an oversight. This oversight does not imply that the SROs were not in direct charge of the fuel-handling activity, but rather indicated a lack of senior operator attention to detail.

3. Corrective Steps Which Have Been Taken and the Results Achieved

All SROs with responsibilities in the area of fuel handling have been instructed to pay greater attention to detail during fuel-handling activities.

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

Applicable procedures will be revised to require that SROs responsible for fuel-handling operations stay in close proximity to the fuel-handling activities. Also, this event and its consequences will be discussed in future operator "fuel-handling" meetings, during which SROs and all persons involved will again be instructed to pay close attention to detail.

5. Date When Full Compliance Will Be Achieved

Full compliance will be achieved before the reload of the unit 1 reactor core (tentatively scheduled for September 15, 1983).

RESPONSE TO NRC SPECIFIC REQUEST
FOR ADDITIONAL INFORMATION - INSPECTION REPORT NOS.
50-259/83-18, 50-260/83-18, 50-296/83-18
DATED JULY 13, 1983

1. Improvements made in control systems to assure commitments made to the NRC are fully met

Response

Since establishment of the Compliance Staff at Browns Ferry in late 1980, considerable improvement has been made in ensuring commitments to NRC have been fully met. During 1981 we were developing and improving our onsite commitment tracking program. The success of this effort is evidenced by the significant reduction in the number of deviations issued in 1982 and 1983 versus those issued in 1981. As the Compliance Staff was brought to approved manpower in 1982 and early 1983, we have added an additional program for tracking and providing close out for NRC inspector followup and unresolved items. We have and are continuing to place more emphasis on closing existing items on this program.

In addition, we began in early 1983 to place management attention on NRC concerns before they were formally issued in inspection reports by placing these items on our "Immediate Attention" list. This list is reviewed daily in our onsite coordination meeting and both the resident inspectors and Region II inspectors are kept up-to-date as to status of their concerns.

Also, in our reply to Inspection Report 83-15, TVA committed to review available sources for procedural commitments in order that they are identified positively as commitment items so that they are not inadvertently deleted. To date, well over 100 separate items have been identified by this review, and we are proceeding to change our procedures to distinctly mark these commitment items.

2. Modifications made in QA and QC programs to assure readiness to undertake major safety-related activities like refueling operations

Response

All QC inspectors will be required to undergo an upgraded fuel-handling class given by the Operations Section, and the quality control fuel-handling certification program will undergo general changes:

a. The Browns Ferry Operations Section will train and administer a written test to the QC inspectors. The Operations Section will forward examination results to the Field Quality Engineering Section.

b. The Field Quality Engineering Section Supervisor (or assistant) will review the examination results and sign the fuel transfer certification form attesting that the inspector successfully completed the necessary classroom training.

c. On-the-job training will be provided by the Field Quality Engineering Supervisor (or assistant). This training will be under the guidance and direction of a certified fuel movement inspector.

d. After completion of the training, the certified inspector will sign the fuel transfer certification form attesting to the proficiency of the inspector being trained.

e. After completion of the classroom and on-the-job training, the Field Quality Engineering Supervisor (or assistant) will verify visual acuity and sign the fuel transfer certification form. The inspector will be considered certified to independently perform fuel movement verifications when the Field Quality Engineering Supervisor (or assistant) signs the fuel transfer certification form certifying the inspector. Finally, before each major fuel movement operation, a briefing or orientation will be held by the Field Quality Engineering management with the Quality Control unit. This briefing will summarize the necessary steps in performing fuel movement verifications and stress attention to detail in every phase of the inspection.

3. Steps taken to increase the presence of plant managers and supervisors at the working sites to personally observe safety-related activities

Response

A goal to require management involvement in work activities has been made a part of the Management Appraisal System for all line managers onsite. This system is used for yearly evaluations of managers performance and is the basis for merit salary adjustment. Management involvement in work activities continues to be an area of specific emphasis by upper level division management as well as upper management at the site.

Particular emphasis is being placed on supervisors observing coaching, correcting, and training their personnel. A block of time is generally set aside on the daily schedule to allow section managers time to be in the work areas to observe and talk with their personnel. Emphasis is being placed on procedural adherence and increased quality of work. A series of seminars emphasizing the commitment have recently been held onsite with cross sections of plant personnel from the worker level up to top management. When problems are identified, emphasis is being placed on identification of the root cause and ensuring that prompt corrective action is taken.

4. Changes made in training programs that will provide additional assurances that both workers and quality control personnel are trained to properly perform safety-related tasks

Response

The training programs at Browns Ferry are in a general upgrading and formalization process. The emphasis to date has been on the General Employee and Operator Training Programs using the INPO accreditation program as a guideline. We have reviewed the training program in general in light of these findings and have upgraded and strengthened the operator and quality control inspector training in the area of fuel handling.