



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET SW SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

April 6, 2004

EA-04-063

Tennessee Valley Authority  
ATTN: Mr. J. A. Scalice  
Chief Nuclear Officer and  
Executive Vice President  
6A Lookout Place  
1101 Market Street  
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT UNIT 1 RECOVERY - NRC INSPECTION  
REPORT NO. 05000259/2004011

Dear Mr. Scalice:

On February 13, 2004, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection associated with recovery activities at your Browns Ferry 1 reactor facility. The enclosed report documents the results of this inspection which were discussed on March 25, 2004, with Mr. Jon Rupert of your staff.

This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examinations of records, documents, discussion with NRC staff, and interviews with licensee personnel.

This report documents an apparent violation which is being considered for escalated enforcement action in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600. The current Enforcement Policy is included on the NRC's Web site at [www.nrc.gov](http://www.nrc.gov); select **What We Do, Enforcement**, then **Enforcement Policy**. The apparent violation involved deficiencies in your quality assurance program related to the Long Term Torus Integrity Program, and concerns the failure to ensure compliance with instructions, procedures, and drawings, and to conduct adequate oversight of torus repair activities, which resulted in multiple examples of omitted repairs. Since the NRC has not made a final determination in this matter, no Notice of Violation is being issued for this inspection finding at this time. In addition, please be advised that the number and characterization of the apparent violation described in the enclosed inspection report may change as a result of further NRC review.

An open predecisional enforcement conference to discuss this apparent violation will be scheduled at a future date. The NRC will contact you regarding this date. The decision to hold a predecisional enforcement conference does not mean that the NRC has determined that a violation has occurred or that enforcement action will be taken. This conference is being held to obtain information to assist the NRC in making an enforcement decision. This may include information to determine whether a violation occurred, information to determine the significance of a violation, information related to the identification of a violation, and information related to any corrective actions taken or planned. The conference will provide an opportunity for you to provide your perspective on these matters and any other information that you believe the NRC should take into consideration in making an enforcement decision.

You will be advised by separate correspondence of the results of our deliberations on this matter. No response regarding the apparent violation is required at this time.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

\\RA by Harold O. Christensen Acting For\\

Charles A. Casto, Director  
Division of Reactor Safety

Docket No. 50-259  
License No. DPR-33

Enclosure: Inspection Report No. 05000259/2004011

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**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No: 50-259

License No: DPR-33

Report No: 05000259/2004011

Licensee: Tennessee Valley Authority

Facility: Browns Ferry Nuclear Plant, Unit 1

Location: Corner of Shaw and Nuclear Plant Roads  
Athens, AL 35611

Dates: January 26 - 30, 2004 and February 9 - 13, 2004

Inspectors: J. Lenahan, Senior Reactor Inspector  
R. Chou, Reactor Inspector  
W. Bearden, Senior Resident Inspector

Approved by: Mark S. Lesser, Chief  
Engineering Branch 2  
Division of Reactor Safety

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## EXECUTIVE SUMMARY

Browns Ferry Nuclear Plant, Unit 1  
NRC Inspection Report 05000259/2004-011

The inspection included observation and review of recovery activities related to Drywell Steel Platform and Long Term Torus Integrity Programs. The inspection program for the Unit 1 Restart Program is described in NRC Inspection Manual Chapter 2509.

### Engineering

No violations or deviations were identified as a result of review of the drywell steel platform program. (Section E1.1)

An apparent violation was identified for deficiencies in the Quality Assurance Program related to the Long Term Torus Integrity Program, involving the failure to ensure compliance with instructions, procedures, and drawings, and to conduct adequate oversight of repair activities, which resulted in multiple examples of omitted repairs. (Section E1.2)

The licensee's corrective actions to address the apparent violation described in Section E1.2 appear to be comprehensive. (Section E1.3)

A noncited violation was identified for failure to accurately measure welds during walkdowns. (Section E1.2)

A noncited violation was identified for inadequate basis for accepting an undersized weld. (Section E1.2)

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## REPORT DETAILS

### III. Engineering

#### **E1 Conduct of Engineering**

##### **E1.1 Drywell Steel Platforms**

###### **a. Inspection Scope**

During investigations performed in the 1980's by the licensee and NRC related to restart of Unit 2, numerous deficiencies were identified in design and construction of safety-related structural steel platforms. These included cracking of clip angles which connect structural members, failure to construct the platforms in accordance with design documents, deficiencies in welding (primarily undersized fillet welds), seismic design issues, and configuration management issues ( ie, failure to control addition of more loads to platforms).

The licensee's commitments for resolution of issues associated with the drywell structural steel platforms are stated in TVA letter dated December 13, 2002, Subject: Browns Ferry Nuclear Plant - Unit 1 - Regulatory Framework for the Restart of Unit 1. The letter references previous commitments for restart of Units 1 and 3 stated in a letter dated July 10, 1991, Subject: Regulatory Framework for the Restart of Units 1 and 3, and NRC approval of the licensee's plans in a letter dated April 1, 1992. Design criteria for design and seismic qualification of the drywell structural steel platforms were submitted to NRC in TVA letters dated June 12, 1991, June 13, 1991, and February 6, 1992. Acceptance of the licensee's design criteria for the structural steel platforms by NRC is documented in a Safety Evaluation Report dated July 13, 1992, Subject: Design Criteria for Lower Drywell Steel Platforms and Miscellaneous Steel. The inspectors reviewed design drawings, installation procedures, work orders, and quality records for installation of the new structural steel for the Elevation 584 drywell platforms.

###### **b. Observations and Findings**

The Unit 1 drywell structural steel platforms have been redesigned to correct the deficiencies. The majority of the original structural steel members were removed and are being replaced. The modified structural platforms are intended to meet current design criteria and have a design margin for addition of future loads, if necessary. The inspectors reviewed TVA Engineering Specifications G-29 and G-89, and TVA procedures MAI-5.2, MAI-5.9, NDE N-VT-3, and NDE N-VT-6 which specify the requirements for welding and installation of structural steel. The inspectors also reviewed DCN 51019 and work orders issued to implement modifications to the Elevation 584 drywell structural steel and verified that information from field walkdowns and design drawings were correctly translated into work instructions. Documents examined included work control instructions, including quality control (QC) holdpoints, weld maps, instructions and location sketches to control installation of new structural steel bolts, and weld travelers. The inspectors examined selected modifications to the Unit 1 elevation 584 drywell structural steel frames and platforms between azimuth 351°

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and 60 ° to verify that modifications were completed in accordance with Quality Assurance (QA) documentation, which included the work order packages, design drawings, and documents contained in the Design Change Notices (DCN). During the walkdown inspection, the inspectors verified the following attributes complied with the requirements shown on the design drawings: member sizes, configuration, weld sizes, type, and length, connection details, and verification of correct type bolts in existing connections.

c. Conclusions

No violations or deviations were identified.

E1.2 Long Term Torus Integrity Program (IP 62002, 37551)

a. Inspection Scope

The inspectors reviewed the licensee's program to identify and correct deficiencies in installation of the torus integrity modifications which had been completed in the early 1980's under Engineering Change Notice (ECN) P-0093. The deficiencies included undersized welds, missing welds, excessive restraint gaps, and installation/ fabrication configurations differing from the modification design drawing requirements. The licensee's commitments for resolution of issues associated with the torus are stated in TVA letter dated December 13, 2002, Subject: Browns Ferry Nuclear Plant - Unit 1 - Regulatory Framework for the Restart of Unit 1. The licensee issued PER 03-017339 to document and correct the deficiencies. Details of the repairs are shown in Work Orders 03-017394-001 through 03-017339-016 and in sketches (Deficiency Fix Requests) referenced in the PER. The inspectors reviewed the following documents: drawings which show results of walkdown inspections to determine existing as-built conditions for the work completed under ECN P-0093, PER 03-017339, calculations which evaluated the existing conditions, and the work orders issued to implement corrective actions. The inspectors also performed walkdown inspections of the torus to evaluate the completed repairs, and reviewed QA/QC records documenting completion and inspection of the repairs.

b. Observations and Findings

Review of Torus Walkdowns to Document Existing Conditions

Walkdown inspections were performed by licensee's contract engineering (Bechtel) personnel to document the as-built condition and configuration of the torus integrity modifications installed under ECN P-0093. The results of the walkdowns were documented on walkdown drawings. The inspectors reviewed TVA procedure WI-BFN-0-CEB-02, Walkdown Instructions for Seismic Issues (Civil), which specified the requirements for performance of the walkdown. The inspectors, accompanied by walkdown personnel, independently examined selected attributes of various structural steel members and piping in the torus to determine weld size, type, and length and



compared these dimensions to those shown on the torus walkdown drawings. The inspectors identified four welds of approximately 40 examined which were incorrectly measured by the licensee's walkdown team. One was 1/8" undersized, while the remaining three were 1/16" undersized.

10 CFR 50, Appendix B, Criteria V, Instructions, Procedures, and Drawings, in part, states 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. Section 8.2, Welding, of Procedure WI-BFN-0-CEB-02, Walkdown Instruction for Seismic Issues (Civil), in part, has a requirement to measure and record fillet weld size. Section 8.2.2.1, Fillet Weld Size Acceptance Criteria, of the same procedure, in part, states that a fillet weld size shall be permitted to be less than the size recorded by 1/16-inch for 1/4 of the length of the weld. Contrary to the above, on January 29, 2004, walkdown drawings of several structural steel members were not appropriate, in that, they contained incorrect weld sizes. These walkdown drawings were used to evaluate the as-built condition for acceptability or modifications. This violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy and will be identified as a Severity Level IV Non-Cited Violation (NCV) 50-259/2004-011-01, Failure to Accurately Measure Welds During Walkdowns. The licensee initiated PER 04-000671 on January 29, 2004, to document and disposition this issue.

#### Review of Engineering Evaluation of Discrepancies

After the walkdown drawings were completed, licensee engineers compared the as-built walkdown data to the original torus integrity modification ECN P-0093 drawings and identified discrepancies between the design requirements and the measured as-built conditions. Engineering calculations were issued to evaluate the discrepancies. Generally welds which were undersized by 1/16" were found to be acceptable, and welds which were undersized by more than 1/16" were identified for repair to restore the design margin. Welds requiring repair were identified on sketches (Deficiency Fix Requests) referenced in PER 03-017394.

The inspectors reviewed walkdown packages WDP-BFN-1-CEB-303-TOR-12 and TOR-20 through TOR-23, and WDP-BFN-1-CEB-001-02-03 which documented the results of the as-built torus integrity modifications. The inspectors compared the walkdown data to the ECN P-0093 drawings to determine if fillet welds, which were identified during the walkdowns to be undersized by more than 1/8 inch were identified as needing to be repaired on the Deficiency Fix Request sketches under PER 03-017339-000. Specific weld details examined were those shown on sketches 4, 5, 6, 31, and 36. The inspectors reviewed calculation number CDQ1-303-2003-2196, Torus Integrity-Review of Walkdown Packages, to determine if the discrepancies identified during the walkdowns were properly evaluated. Review of the calculation for disposition of welds which were determined by the licensee's walkdown team to be 1/16" undersized, disclosed the following justification to accept as-is: "The size of the fillet weld is found to be undersized by 1/16 " for the bottom stiffener. By engineering judgement this

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discrepancy is accepted as it is too small to be measured accurately.” This statement does not provide sufficient technical basis for accepting the undersized welds.

10 CFR 50, Appendix B, Criteria V, Instructions, Procedures, and Drawings, in part, states 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. Paragraph 3.2.2 I of TVA procedure NEDP-2, Design Calculation Process Control, requires that technical justification and basis for engineering judgement be provided in the calculation. Contrary to the above, on January 29, 2004, technical justification and basis in calculation CDQ1-303-2003-2196 was not sufficient to accept an undersized weld on the bottom stiffener. This violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy and will be identified as a Severity Level IV Non-Cited Violation (NCV) 50-259/2004-011-02, Inadequate Basis for Accepting Undersized Weld. The licensee initiated PER 04-000656 on January 29, 2004, to document and disposition this issue.

Following concerns raised by the inspectors regarding several repair issues discussed in subsequent paragraphs, an engineering review was initiated by Bechtel engineers. The objective of the review was to verify that discrepancies identified during the torus walkdowns performed in summer/fall 2003 were adequately evaluated in the design calculations and that discrepancies requiring repair were included in engineering output documents (Deficiency Fix Request sketches). This review identified errors which resulted in approximately 50 required repairs which had either not been evaluated or incorporated on the Deficiency Fix Request sketches, or the repairs were shown at the incorrect locations.

10 CFR 50, Appendix B, Criteria V, Instructions, Procedures, and Drawings, in part, states 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. Section 3.1.1 of TVA procedure NEDP-5, Design Documents Review, requires the preparer of design documents to provide an adequate and accurate solution for the problem, provide a quality product, and ensure that the design documents are complete. Section 3.1.2 of Procedure NEDP-5 requires the Checker (design verifier) to verify the design documents are adequate, complete and accurate. The failure to evaluate or incorporate numerous deficient welds into Deficiency Fix Requests sketches is identified as the first example of Apparent Violation (AV) 50-259/2004-011-03.

#### Review of Repairs to Undersized/Missing Torus Welds

The inspectors examined selected repairs to the torus to determine if the repairs had been completed in accordance with the corrective actions specified in PER 03-017339-000 and the referenced drawings (Deficiency Fix Requests). Work orders, containing weld data sheets, were generated to repair welds that were identified in the Deficiency Fix Requests. During the walkdown inspection, the inspectors examined weld sizes, type, and length and compared these attributes to the requirements shown on the

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sketches and in the work order instructions. The inspectors found that some welds had not been repaired as specified on the repair sketches, although the work order documentation, specifically weld maps and data sheets, indicated the welds had been repaired by craft personnel and had been inspected and accepted by QC personnel. These included the following eight welds on the main steam relief valve vent piping supports: weld number MS-1-WO 03017394016-008 in work order 03-017394-016, weld numbers PCI-1-WO 03017394002-029 and -30 in work order 03-017394-002, and weld numbers PCI-1-002-004, -005, and -006, and MS-1-WO 03017394006-047 and -048 in work order 03-017394-006. The inspectors concluded that repairs were completed at the incorrect locations for the above welds, and the welds which were designated for repair had not been corrected by the craft as required by the instructions and drawings in the work orders, and as documented.

The licensee assigned a team of two quality control personnel to reinspect the supports and determine the existing weld sizes to confirm the weld issues discussed above. The licensee's team reinspected the welds listed above in work order 03-017394-006 (shown on Deficiency Fix Request Sketch 31) for the stiffener plates on the main steam vent pipe in Bay 6. The inspectors reviewed the results from the field inspections and identified discrepancies in the re-measured weld sizes. In addition, based on reviewing weld data sheets and the weld maps in the work order package, and comparing the existing conditions in the torus with the work order documents, it appeared that some welds were either not repaired, or the repairs were completed at the incorrect locations. Examination by the licensee of additional welds in bays 2, 3 and 16 and documentation in the corresponding work orders disclosed that several additional welds were either not repaired, or the specified repairs were completed in incorrect locations. However, the work order documentation (weld data sheets) indicated the required repairs had been completed.

The inspectors raised a concern that a significant problem appeared to be the inability of personnel to correctly reference their orientation in the torus to the location of a specific weld as depicted on a drawing, and to correctly interpret drawing requirements. Licensee personnel had identified similar problems during November, 2003, resulting in work being performed at the incorrect locations. These problems were documented and disposed in PER numbers 03-022390-000, 03-022683-000, 03-022702-000, and 03-023354-000. The licensee initiated a review to verify that repairs had been made in the correct location. As a result of this review, approximately 20 additional welds were found to have been made at the incorrect location. The failure to perform numerous repairs on the correct welds is identified a second example of Apparent Violation 50-259/2004-011-03.

TVA procedure number N-VT-6, Visual Inspection of Structural Welds Using the Criteria of NCIG-01, requires quality control inspectors to perform an independent inspection of completed work activities important to safety. A requirement of the inspection procedure is independent verification the work was performed at the correct location. QC inspection personnel failed to independently verify that welds designated as weld numbers MS-1-WO 03017394016-008 in work order 03-017394-016, weld numbers PCI-1-WO 03017394002-029 and -30 in work order 03-017394-002, and weld numbers

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PCI-1-002-004, -005, and -006, and MS-1-WO 03017394006-047 and -048 in work order 03-017394-006 were completed at the correct location. The deficient welds at these locations identified in the discrepancies described under PER 03-017394 remained uncorrected. The licensee initiated PER numbers 04-000655 and 04-000705 to document and disposition these issues. The failure of QC to independently verify the correct locations for numerous weld repairs is identified as a third example of Apparent Violation 50-259/2004-011-03.

Further review of documents by the inspectors in Work Order 03-017394-006 disclosed that weld data sheets had not been prepared for six welds shown on the Deficiency Fix Request sketches. Consequentially, these welds had not been repaired. Paragraph 3.2 of TVA procedure MMDP-1, Maintenance Management System, requires work orders to be developed to a level of detail appropriate for the circumstances which addresses the aspects of the work, including the scope of the work and work instructions. When approved procedures are available to cover all or part of the scope of work, MMDP-1 requires that the work order specify that work is to be performed in accordance with the approved procedures. TVA procedure MMDP-10, Controlling Welding, Brazing, and Soldering Processes, specifies the requirements for control of welding activities. Section 3.3 of MMDP-10 requires work implementing documents and weld data sheets be prepared and included in the work order for all welding activities. Paragraph 3.8.1 of TVA procedure MMDP-1 requires independent/technical review of the work order to insure the work order contains detailed work steps to perform the required work prior to approval and implementation of the work orders. Work implementing documents and weld data sheets for six welds which required restoration to the sizes shown on Deficiency Fix Request, Sketch Number 31, referenced in PER 03-017339, were omitted from Work Order 030017394-006. The omission was not identified when performing the independent technical quality review. As a result, repairs to the deficient welds at these locations were not performed. The licensee's followup review of this concern identified approximately 30 more examples where welds requiring repairs were omitted from the work order, and therefore not performed. The omission of numerous welds requiring repair from work orders is identified as the fourth example of Apparent Violation 50-259/2004-011-03.

c. Conclusions

An Apparent Violation (AV) of 10CFR50 Appendix B Criterion V, with four examples, was identified involving repairs to the torus as part of the Long Term Torus Integrity Program:

- Numerous welds of torus structures requiring repairs were not evaluated or not incorporated in documents identifying the need for repair and therefore not repaired
- Numerous welds were found to have been made at the incorrect location
- QC inspection personnel failed to independently verify that numerous welds were completed at the correct location
- Numerous welds identified for repairs were omitted from work orders, and therefore not performed

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This Apparent Violation appears to represent a deficiency in the licensee's quality assurance program related to the Long Term Torus Integrity Program, involving the failure to ensure compliance with instructions, procedures, and drawings, and to conduct adequate oversight of such activities, which resulted in multiple examples of omitted repairs.

A noncited violation was identified for failure to accurately measure welds during walkdowns.

A noncited violation was identified for inadequate basis for accepting an undersized weld.

### E1.3 Corrective Actions to Correct Deficiencies in Long Term Torus Integrity Program

#### a. Inspection Scope

The inspectors performed a review of the licensee's corrective actions to resolve the problems identified by NRC in performance of the torus walkdown inspections, errors in engineering evaluation of the discrepancies identified by the walkdowns, deficiencies in preparation of work orders for implementation of corrective actions, and errors in implementing and inspecting the corrective actions.

#### b. Observations and Findings

An independent walkdown inspection was performed by design engineering (Bechtel) teams to reinspect the original torus integrity modifications to verify that the as-built conditions that were identified and documented in walkdown packages were correct. Included in this program were all welds not modified during Unit 1 recovery activities and those not re-inspected in response to an NRC identified violation (NCV259/2003-010-001) for inadequate inspection of as-built pipe supports. The licensee revised the acceptance criteria for determining fillet weld sizes. Using the revised criteria, the actual as-built fillet weld size was recorded on the walkdown drawing. The revised criteria did not permit recording a weld size that was undersized by 1/16-inch for up to 25 percent of the weld length. The minimum measured weld size was recorded. The inspectors reviewed the results of the licensee's reinspection program which showed that approximately 10 percent of the welds were indicated to be undersized. The majority of the undersized welds were found to be 1/16" less than indicated on the original walkdown drawings. These dimension changes were primarily due to the change in the inspection and acceptance criteria. However approximately 90 welds were identified which were determined to be more than 1/16" smaller than documented on the walkdown sketches. The licensee is re-evaluating these.

A review of design calculations by Bechtel engineers was initiated verify that the calculations were adequate to evaluate discrepancies and that the basis for engineering judgement is adequately documented. The review intends to ascertain that calculations adequately document and justify "use-as-is" discrepancies and provide a sound

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technical basis for use of engineering judgement. Critical thinking will be sufficiently documented so that any qualified individual can independently review and understand basis for calculation conclusions. A sample of calculations in other discipline areas will also be reviewed by Bechtel to determine extent of using "engineering judgement" within the calculations as a basis for acceptability of a condition without adequately documenting the basis of the engineering judgement.

A review of design documents [calculations and design output documents (deficiency fix request sketches)] was completed by Bechtel engineers to verify that discrepancies identified during the torus walkdowns performed in summer/fall 2003 were adequately evaluated in the design calculations and that discrepancies requiring repair were included in engineering output documents. The inspectors examined the results of the Bechtel review. Approximately 50 welds which required repair had not been shown on the deficiency fix request sketches.

The licensee also performed a review of work orders issued by Unit 1 recovery planners for implementation of torus modification repair activities to verify all work activities specified in design documents and under PER 03-017339 corrective actions were included in the individual work orders, and that completed work was properly documented. The independent review of the work orders was accomplished by comparing work activities listed in work orders to those shown on design drawings and documentation of completed work activities (e.g. weld travelers, QC records, etc) to verify that all work listed in individual work orders was completed in accordance with licensee's QA/QC program. The results of the licensee's review and types of deficiencies identified approximately 30 additional welds which were not included in the work order instructions.

The inspectors reviewed the results of field validation walkdown inspection by two independent teams, one team of two QC inspectors, and another team which included a craft foreman and a field engineer. This validation inspection included a 100 percent re-inspection of modifications completed in the torus for PER 03-017394 during the Unit 1 recovery program, to verify work completed in accordance with design requirements and to identify any incomplete or inadequate work. Walkdowns were performed by two independent teams and documented on torus weld verification checklists prepared independently by each team. The inspectors reviewed the checklists documenting the results of the initial re-inspection walkdowns. Subsequent to the inspection the licensee completed the process of comparing the results from the two independent walkdown teams and reconciling the differences. A total of 122 deficiencies were identified. These were as follows: 19 with arc strikes, splatter, etc; 23 in wrong location; 14 requiring additional documentation; 14 unsatisfactory; and 52 undersized. The inspectors considered that a reason for the majority of the undersized welds was use of a more rigorous acceptance criteria.

c. Conclusions

The licensee initiated a 100% review of weld repairs in the Long Term Torus Integrity Program. The licensee's corrective actions appear to be comprehensive to resolve the problem. No additional violations or deviations were identified.

**V. Management Meetings**

**X1 Exit Meeting Summary**

On January 30 and February 13, 2004, the inspectors presented the inspection results to Mr. Jon Rupert and other members on his staff, who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection. Additionally, on March 25, 2004, Mr. Mark S. Lesser summarized the findings with Mr. Rupert and members of his staff via teleconference.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee personnel

T. Abney, Licensing and Industry Affairs Manager  
R. Cutsinger, Supervisory Civil Engineer  
R. Drake, Unit 1 Maintenance/Modifications Manager  
S. Kane, Licensing Engineer  
G. Lupardus, Unit 1 Civil Design Engineer  
J. Rupert, Vice-President, Unit 1 Recovery  
S. Tanner, Nuclear Assurance Supervisor  
J. Valante, Engineering Manager, Unit 1 Recovery

### **INSPECTION PROCEDURES USED**

IP 37551	Engineering
IP 62002	Inspection of Structures, Passive Components, and Civil Engineering Features at Nuclear Power Plants

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Items Opened

05000259/04-11-03	AV	Failure to Implement Quality Assurance Requirements Over Torus Repair Activities, Which Resulted in Multiple Examples of Omitted Repairs (Section E1.2)
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#### Items Opened and Closed

05000259/04-011-01	NCV	Failure to Accurately Measure Welds During Walkdowns (Section E1.2)
05000259/04-011-02	NCV	Inadequate Basis for Accepting Undersized Weld (Section E1.2)

#### Discussed

None



## Documents Examined

TVA General Engineering Specification G-89, Requirements for Structural and Miscellaneous Steel, Rev. 3, dated 4/26/94.

TVA General Engineering Specification G-29A, PS 0.C.1.2, Specification for Welding of Structures Fabricated in Accordance with AISC Requirements for Buildings and Inspected to the Criteria of NCIG-01, Rev 3, dated 7/28/99.

TVA General Engineering Specification G-29-S01, PS 4.M.4.4, ASME Section III and Non-ASME (Including AISC, ANSI B31.1 and ANSI B31.5) Bolting Material, Rev 5, dated 11/12/02.

Addendum 2 to Process Specification G-29-S01, 3.C.5.5, Visual Examination of Welds, Rev 0.

MAI-1.3, General requirements for Modifications, Rev. 16, dated 9/15/03.

MAI-5.2, Bolting and Structural Connections, Rev. 14, dated 6/23/03.

MAI-5.9, Fabrication and Installation of Structural and Miscellaneous Steel, Rev. 11, dated 6/16/03.

MMDP-1, Maintenance Management System, Rev. 6, dated 9/26/03

MMDP-10, Controlling Welding, Brazing, and Soldering Processes, Rev. 4, dated 1/15/03

NEDP-1, Design Basis and Design Document Control, Rev. 4, dated 7/9/01

NEDP-2, Design Calculation Process Control, Rev. 9, dated 7/17/03

NEDP-5, Design Document Reviews, Rev. 2, dated 7/9/01

SPP-3.1, Corrective Action Programs, Rev. 5, dated 12/18/03

SPP-9.3, Plant Modifications and Engineering Change Control, Rev. 9, dated 9/9/03

Nondestructive Examination Procedure No. N-VT-3, Visual Examination of Weld Ends, Fit-ups, and Dimensional Examination of Weld Joints, Rev. 23, dated 1/24/03

Nondestructive Examination Procedure No. N-VT-6, Visual Examination of Structural Welds Using the Criteria of NCIG-01, Rev. 6, dated 1/22/97

General Design Criteria Document BFN-50-C-7100, Design of Civil Structures, Rev. 13, dated 12/20/00

TVA Nuclear Engineering Civil Design Standard DS-C1.7.1, General Anchorage to Concrete, Rev 9, dated 8/25/99

Technical Instruction 0-TI-466, Plant Modification Related Work Order Preparation and Processing, Rev. 1, dated 1/26/04

Drawing number 1-48E443-1, Structural Steel Drywell Floor Framing, Elev. 584' - 91/2", Rev. 6

Drawing number 1-48E443-2, Structural Steel Drywell Floor Framing at Elev. 584' - 91/2", Azimuth 351° to 82°, Rev. 6

Drawing number 1-48E443-6, Structural Steel Floor Framing at Elev. 584' - 91/2", Sections & Details, Sheet 1, Rev. 5

Drawing number 1-48E443-7, Structural Steel Floor Framing at Elev. 584' - 91/2", Sections & Details, Sheet 2, Rev. 5

Drawing number 1-48E443-8, Structural Steel Floor Framing at Elev. 584' - 91/2", Sections & Details, Sheet 3, Rev. 6

Drawing number 1-48E443-12, Structural Steel Floor Framing at Elev. 584' - 91/2", Sections & Details, Sheet 7, Rev. 2

Drawing number 1-48E443-15, Structural Steel Drywell Floor Framing, Elev. 584' - 91/2", Rev. 1

Drawing number 1-48E443-17, Structural Steel Mark and Assembly No. Listing, Elev. 584' -91/2", Sheet 1, Rev. 2

Drawing number 1-48E443-18, Structural Steel Mark and Assembly No. Listing, Elev. 584' -91/2", Sheet 2, Rev. 1

Drawing number 1-48E443-19, Structural Steel Mark and Assembly No. Listing, Elev. 584' -91/2", Sheet 3, Rev. 1

Drawing number 1-48E443-20, Structural Steel Mark and Assembly No. Listing, Elev. 584' -91/2", Sheet 4, Rev. 2

Drawing number 1-48W1218-7, Miscellaneous Steel Drywell - Relief Valve Vents Pipe Supports, Rev. 13

Drawing number 1-48N1218-10, Miscellaneous Steel Drywell - Relief Valve Vents Pipe Restraints, Rev. 9

Drawing number 1-48N1247-1, Miscellaneous Steel - Torus Ring Girder Internal reinforcement, Rev. 0

Drawing number 1-48W1251-1, Miscellaneous Steel - Torus Walkway & Access Platforms - EI 540, Rev. 12

Drawing number 1-48W401-5, Mechanical Main Steam Relief Valve Vent Piping, Rev. 20

Drawing number 1-48W401-8, Mechanical Main Steam Relief Valve Vent Piping, Rev. 0

DCN 51019, Civil Drywell Lower Steel, EL 584

Work Order 02-008179-007, Re-install Drywell Steel Azimuth 30 to 60 Degrees on Elevation 584.0 Per the Marked Up Drawing

Walkdown Package WDP-BFN-1-CEB-303-TOR-12, As-Built Miscellaneous Steel Drywell Relief Valve Vent Pipe Restraints from Azimuth 0° to 90°

Walkdown Package WDP-BFN-1-CEB-303-TOR-20, As-Built Miscellaneous Torus Ring Girder Internal Reinforcement from Azimuth 0° to 90°

Walkdown Package WDP-BFN-1-CEB-303-TOR-21, As-Built Miscellaneous Torus Ring Girder Internal Reinforcement from Azimuth 90° to 180°

Walkdown Package WDP-BFN-1-CEB-303-TOR-22, As-Built Miscellaneous Torus Ring Girder Internal Reinforcement from Azimuth 180° to 270°

Walkdown Package WDP-BFN-1-CEB-303-TOR-23, As-Built Miscellaneous Torus Ring Girder Internal Reinforcement from Azimuth 270° to 0°

Walkdown Instruction WI-BFN-0-GEN-01, General requirements for BFN Unit 1 Walkdowns, Rev. 1, dated 2/22/02

Walkdown Instruction WI-BFN-0-CEB-02, Walkdown Instructions for Seismic Issues (Civil), Rev. 0, dated 3/19/02

DCN 51020, Civil Drywell Lower Steel, EL 563

DCN 51019, Civil Drywell Lower Steel, EL 584

Torus Weld Verification Check Lists, for Craft/Resident Engineer Team, and Quality Control Team

PER 03-017339-000, Construction Discrepancies Identified in Unit 1 Torus

PER 03-022390-000, Weld Repair Performed at Incorrect Location in Bay #1 of Unit 1 Torus

PER 03-022683-000, Discrepancies Between Weld Locations Identified in the Field and Those Shown on the Drawings in Unit 1 Torus

PER 03-022702-000, QC Inspectors Identified Three Welds which were Completed at Incorrect Locations in Unit 1 Torus

PER 03-023354-000, QC Inspectors Identified Five Welds which were Completed at Incorrect Locations in Unit 1 Torus

Deficiency Fix Requests, Sketches 4, 5, 6, 29, 30, 31, and 36, Corrective Actions for PER 03-017339