



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET SW SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

April 16, 2004

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: WATTS BAR NRC INTEGRATED INSPECTION REPORT 05000390/2004002  
AND 05000391/2004002**

Dear Mr. Scalice:

On March 27, 2004, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Watts Bar Nuclear Plant, Units 1 and 2. The enclosed integrated inspection report documents the inspection results which were discussed on March 31, 2004, with Mr. L. Bryant and other members of your staff.

The inspection examined 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. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents two NRC-identified findings and one self-revealing finding of very low safety significance (Green). The three issues were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they are entered into your corrective program, the NRC is treating these three findings as non-cited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. If you contest any NCV in the enclosed report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Watts Bar facility.

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Sincerely,

*/RA/*

Stephen J. Cahill, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Docket Nos. 50-390, 50-391  
License No. NPF-90 and Construction  
Permit No. CPPR-92

Enclosure: NRC Inspection Report 05000390/2004002, 05000391/2004002  
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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cc w/encls:

Karl W. Singer  
Senior Vice President  
Nuclear Operations  
Tennessee Valley Authority  
Electronic Mail Distribution

James E. Maddox, Vice President  
Engineering and Technical Services  
Tennessee Valley Authority  
Electronic Mail Distribution

William R. Lagergren  
Site Vice President  
Watts Bar Nuclear Plant  
Tennessee Valley Authority  
Electronic Mail Distribution

General Counsel  
Tennessee Valley Authority  
Electronic Mail Distribution

Thomas Niessen, Acting General Manager  
Nuclear Assurance  
Tennessee Valley Authority  
Electronic Mail Distribution

Mark J. Burzynski, Manager  
Nuclear Licensing  
Tennessee Valley Authority  
Electronic Mail Distribution

Paul L. Pace, Manager  
Licensing and Industry Affairs  
Watts Bar Nuclear Plant  
Tennessee Valley Authority  
Electronic Mail Distribution

Larry S. Bryant, Plant Manager  
Watts Bar Nuclear Plant  
Tennessee Valley Authority  
Electronic Mail Distribution

County Executive  
Rhea County Courthouse  
375 Church Street, Suite 215  
Dayton, TN 37321-1300

County Mayor  
P.O. Box 156  
Decatur, TN 37322

Lawrence E. Nanney, Director  
TN Dept. of Environment & Conservation  
Division of Radiological Health  
Electronic Mail Distribution

Ann Harris  
341 Swing Loop  
Rockwood, TN 37854

James H. Bassham, Director  
Tennessee Emergency Management Agency  
Electronic Mail Distribution

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos: 50-390, 50-391

License Nos: NPF-90 and Construction Permit CPPR-92

Report No: 05000390/2004002, 05000391/2004002

Licensee: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Units 1 and 2

Location: 1260 Nuclear Plant Road  
Spring City TN 37381

Dates: December 28, 2003, through March 27, 2004

Inspectors: J. Bartley, Senior Resident Inspector  
J. Reece, Resident Inspector  
R. Carrion, Project Engineer (Sections 1R06, 4OA5.1)  
S. Shaeffer, Senior Project Engineer (Section 4OA5.2 )

Approved by: Stephen J. Cahill, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000390/2004002, 05000391/2004002; 12/28/2003 - 03/27/2004; Watts Bar, Units 1 & 2; Surveillance Testing, Event Followup, Problem Identification and Resolution

The report covered approximately a three-month period of routine inspection by resident inspectors and announced inspections by regional project engineers. Three Green non-cited violations (NCVs) were identified. The significance of issues is indicated by their color (Green, White, Yellow, Red) using the Significance Determination Process in Inspection Manual Chapter 0609, Significance Determination Process (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, Reactor Oversight Process, Revision 3, dated July 2000.

### A. NRC-Identified Findings and Self-Revealing Findings

#### **Cornerstone: Initiating Events**

- Green. Licensee technicians failed to follow a reactor protection system surveillance instruction and caused a reactor trip.

This finding was a self-revealing non-cited violation of Technical Specifications (TS) 5.7.1. This finding was more than minor because it affected the initiating events cornerstone by causing a reactor trip. It was of very low safety significance because it did not contribute to the likelihood of a primary or secondary system loss of coolant accident (LOCA) initiator, did not contribute to a loss of mitigation equipment functions, and did not increase the likelihood of a fire or internal/external flood. The cause of the finding is related to the cross-cutting element of human performance. (Section 4OA3.2)

#### **Cornerstone: Mitigating Systems**

- Green. The inspectors identified an inadequate procedure involving the control of emergency core cooling system (ECCS) venting. The performance deficiency resulted in an unexpected accumulation of gas in the RHR system

This finding was a non-cited violation of TS Surveillance Requirement (SR) 3.5.2.3. It is more than minor because it degraded the residual heat removal injection function of the mitigating system cornerstone by allowing a significant accumulation of gas in the injection lines. This finding is of very low safety significance because it did not result in a loss of function per Generic Letter 91-18, did not represent an actual loss of safety function, and was not potentially risk-significant due to external events. (Section 1R22)

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- Green. The inspectors identified that the licensee's corrective actions for previous venting ECCS problems were inadequate.

This finding is a non-cited violation of 10 CFR, Part 50, Appendix B, Criterion XVI, Corrective Action. This finding is more than minor because it affected the mitigating system cornerstone. A resultant accumulation of gas adversely impacted the capability of the B safety injection pump to perform its accident mitigation function. This finding is of very low safety significance because it did not result in an actual loss of safety function, and was not potentially risk-significant due to external events. The cause of the finding is related to the cross-cutting element of problem identification and resolution. (Section 40A2.3)

B. Licensee - Identified Violations

None

## Report Details

### Summary of Plant Status

Unit 1 operated at or near 100 percent power for the entire inspection period except for one reactor trip. On January 16, Unit 1 automatically tripped due to an invalid turbine trip signal caused by a maintenance activity. The unit was restarted on January 18. Unit 2 remained in a deferred construction status.

## **1. REACTOR SAFETY**

### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

#### 1R01 Adverse Weather Protection

##### a. Inspection Scope

On January 6, 2004, the inspectors reviewed licensee actions for forecasted sub-freezing temperatures to verify that the actions were in accordance with 1-PI-OPS-1-FP, Freeze Protection, and TI-10.17, Freeze Protection Program. The inspectors reviewed open work orders (WOs) on freeze protection components to verify that the outstanding work would not impair the systems' function. In addition, the inspectors walked down portions of the refueling water storage tank, steam and feedwater lines, and essential raw cooling water (ERCW) lines to verify that insulation was in place and heat trace systems were intact.

##### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignment

##### a. Inspection Scope

The inspectors conducted three equipment alignment partial walkdowns to evaluate the operability of selected redundant trains or backup systems, listed below, with the other train or system inoperable or out of service. The inspectors reviewed the functional system descriptions, Updated Final Safety Analysis Report (UFSAR), system operating procedures, and Technical Specifications (TSs) to determine correct system lineups for the current plant conditions. The inspectors performed walkdowns of the systems to verify that critical components were properly aligned and to identify any discrepancies which could affect operability of the redundant train or backup system. Documents reviewed are listed in the attachment.

- B train auxiliary air compressor out of service - walked down A train auxiliary air compressor and A train auxiliary building gas treatment system (ABGTS), emergency gas treatment system (EGTS), control room emergency ventilation system (CREVS), control room emergency air temperature control system (CREATS), and auxiliary feedwater (AFW) system

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- Walked down A train motor-driven auxiliary feedwater (MDAFW) pump and turbine-driven auxiliary feedwater (TDAFW) with B MDAFW pump out of service (OOS)
- Walked down A and B train MDAFW pumps with TDAFW pump inoperable

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors conducted tours of eight areas important to reactor safety, listed below, to verify the licensee's implementation of fire protection requirements as described in the Fire Protection Program, Standard Programs and Processes (SPP)-10.0, Control of Fire Protection Impairments, SPP-10.10, Control of Transient Combustibles, SPP-10.11, Control of Ignition Sources (Hot Work). The inspectors evaluated, as appropriate, conditions related to: (1) licensee control of transient combustibles and ignition sources; (2) the material condition, operational status, and operational lineup of fire protection systems, equipment, and features; and (3) the fire barriers used to prevent fire damage or fire propagation.

- Control room emergency ventilation system
- Vital DC Boardroom I
- Vital DC Boardroom II
- Vital DC Boardroom III
- Vital DC Boardroom IV
- A 6.9 KV Shutdown boardroom (SDBR)
- B 6.9 KV SDBR
- MDAFW pumps/component cooling system (CCS) pumps

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors reviewed licensee flood analysis documents to identify design features important to external flood protection and areas that can be affected by flooding; design flood levels; and protection features for areas containing safety-related equipment, such as level switches and sumps. The inspectors also interviewed cognizant licensee personnel about site flood protection measures and plant drainage plans.

The inspectors reviewed licensee instructions for cross-tying systems in the event of severe flooding and evaluated the availability of the identified spool piece to be used



between several systems, including between the high pressure fire protection system and the AFW system; between the ERCW and component cooling systems to the sample heat exchangers' line; between the auxiliary charging system and the charging system normal charging line; between the reactor coolant drain tank and the flood mode boration makeup system; and between the ERCW system and the raw cooling water (RCW) system. The inspectors also reviewed selected operator logs for identified flooding issues and the licensee's corrective action program for documents with respect to flood-related items identified in problem evaluation reports (PERs) written in 2003 to verify the adequacy of the corrective actions. The inspectors reviewed completed preventive maintenance (PM) procedures and work orders (WOs) for identified level switches, pumps, and safety related class 1E manholes to assess for completeness and frequency. The inspectors walked down the lower level of the intake pumping structure to observe material condition of its flooding protection features such as doors, floor drains, sump level switches, and sump pumps. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

On March, 16, 2004, the inspectors observed operators in the plant's simulator during licensed operator annual requalification training to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures TRN-1, Administering Training, and TRN-11.4, Continuing Training for Licensed Personnel. The inspectors observed a shift crew's response to training scenario 3-OT-SRT0075B, Reactor Coolant Pump Seal Abnormalities.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed two performance - based problems: a slow stroke time of a AFW level control valve and a main steam isolation valve that failed to fully close. The focus of the reviews was to assess the effectiveness of maintenance efforts that apply to structures, systems, or components (SSCs) under the scope of the Maintenance Rule (10 CFR 50.65) and to verify that the licensee was following the requirements of licensee procedures TI-119, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting 10 CFR 50.65, and SPP-6.6, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting 10 CFR 50.65. Reviews focused, as appropriate, on (1) appropriate work

practices; (2) identification and resolution of common cause failures; (3) scoping in accordance with 10 CFR 50.65; (4) characterization of reliability issues; (5) charging unavailability time; (6) trending key parameters; (7) 10 CFR 50.65 (a) (1) or (a) (2) classification and reclassification; and (8) the appropriateness of performance criteria for SSCs classified as (a) (2) or goals and corrective actions for SSCs classified as (a) (1). Specific documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors evaluated, as appropriate for the five work activities listed below: (1) the effectiveness of the risk assessments performed before maintenance activities were conducted; (2) the licensee's management of risk; (3) that, upon identification of an unforeseen situation, necessary steps were taken to plan and control the resulting emergent work activities; and (4) that maintenance risk assessments and emergent work problems were adequately identified and resolved. The inspectors verified that the licensee was complying with the requirements of 10 CFR 50.65 (a)(4); SPP-7.0, Work Control and Outage Management; SPP-7.1, Work Control Process; and TI-124, Equipment to Plant Risk Matrix.

- 1B AFW pump motor inspection and oil check coincident with calibration of relay 1-62-003-0126A/B (ERCW to 1B MDAFW/TDAFW)
- A train main control room (MCR) chiller outage coincident with 1-SI-211-4-A, 92-Day Trip Actuating Device Operational Test on Undervoltage Relays for 1A-A69 KV Shutdown Board
- B train auxiliary air compressor outage
- TDAFW pump inoperable to inspect and repair 50% blockage on A train ERCW suction piping
- Standby main feedpump component outage coincident with A train electric boardroom chiller outage

b. Findings

No findings of significance were identified.

#### 1R14 Personnel Performance During Non-routine Plant Evolutions

##### a. Inspection Scope

On January 16, the inspectors responded to the main control room to observe the licensee's response to a reactor trip. The inspectors reviewed operator logs, plant computer data, completed procedures, and interviewed plant personnel to determine what occurred and how the operators responded. In addition, the inspectors verified that the operator response was in accordance with plant procedures. Further details associated with this event are documented in Section 4OA3.2. Documents reviewed are listed in the attachment.

##### b. Findings

No findings of significance were identified.

#### 1R15 Operability Evaluations

##### a. Inspection Scope

The inspectors reviewed five operability evaluations affecting risk-significant mitigating systems, listed below, to assess, as appropriate: (1) the technical adequacy of the evaluations; (2) whether continued system operability was warranted; (3) whether other existing degraded conditions were considered as compensating measures; (4) whether the compensatory measures, if involved, were in place, would work as intended, and were appropriately controlled; (5) where continued operability was considered unjustified, the impact on TS Limiting Conditions for Operation (LCOs) and the risk significance in accordance with the Significance Determination Process (SDP). The inspectors verified that the operability evaluations were performed in accordance with SPP-3.1, Corrective Action Program.

- PER 03-014922-000, Gas found in B train piggyback piping
- PER 04-000141-000, Auxiliary building 2B exhaust fan damper failed post-maintenance test (PMT), stuck 20% open
- PER 04-000139-000, Unplanned entry into LCO due to annulus pressure dropping below TS limits
- PER 04-000432-000, 50% blockage discovered on A train ERCW suction piping to TDAFW pump
- PER 04-000304-000, Air between ERCW isolation valves in AFW pump supply lines

##### b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testinga. Inspection Scope

The inspectors reviewed five PMT procedures and/or test activities, as appropriate, for selected risk-significant mitigating systems to assess whether: (1) the effect of testing on the plant had been adequately addressed by control room and/or engineering personnel; (2) testing was adequate for the maintenance performed; (3) acceptance criteria were clear and adequately demonstrated operational readiness consistent with design and licensing basis documents; (4) test instrumentation had current calibrations, range, and accuracy consistent with the application; (5) tests were performed as written with applicable prerequisites satisfied; (6) jumpers installed or leads lifted were properly controlled; (7) test equipment was removed following testing; and (8) equipment was returned to the status required to perform its safety function. The inspectors verified that these activities were performed in accordance with SPP-8.0, Testing Programs; SPP-6.3, Pre-/Post-Maintenance Testing; and SPP-7.1, Work Control Process.

- WO 03-022693-000, Excessive leakage through steam generator (SG) 1 TDAFW level control valve
- WO 03-006121-000, Disassemble, inspect, re-grease, and re-assemble motor/pump coupling on 2A CCS pump
- WO 03-016809-000, Replace A main control room chiller compressor shaft seal
- WO 03-813465-000, Replace emergency diesel generator 1A-A auxiliary AC lube oil pump
- WO 03-004560-000, Implement design change to replace obsolete pressure switches on auxiliary air compressors

b. Findings

No findings of significance were identified.

1R22 Surveillance Testinga. Inspection Scope

The inspectors witnessed five surveillance tests and/or reviewed test data of selected risk-significant SSCs, listed below, to assess whether the SSCs met the requirements of the TS; the UFSAR; SPP-8.0, Testing Programs; SPP-8.2, Surveillance Test Program; and SPP-9.1, ASME Section XI. The inspectors also determined whether the testing effectively demonstrated that the SSCs were operationally ready and capable of performing their intended safety functions. The inspectors also completed a review of unresolved item (URI) 50-390/02-04-02, Inadequate Surveillance Instruction Resulting in Gas Accumulation in ECCS Piping, as documented in Watts Bar NRC Integrated Inspection Report 50-390/02-04 and 50-391/02-04. Additional documents reviewed are listed in the attachment.

- WO 03-017354-000, Perform 1-SI-3-22, 18-Month Channel Calibration Auxiliary Feedwater Pump 1B-B Suction Header Pressure Switches

- WO 03-017348-000, Perform 1-SI-3-901-B, Motor-Driven Auxiliary Feedwater Pump 1B-B Quarterly Performance Test
- WO 02-015294-000, Perform 0-SI-65-9-B 18-Month Emergency Gas Treatment System Pressure Test, Train B
- WO 03-017594-000, Perform 1-SI-30-26-A, Containment Air Return Fan 1A-A Quarterly Operability Test
- WO 03-022733-000, Perform 1-SI-3-902, Turbine Driven Auxiliary Feedwater Pump 1A-S Quarterly Performance Test

b. Findings

(Closed) URI 05000390/2002004-02, Inadequate Surveillance Instruction Resulting in Gas Accumulation in ECCS Piping

Introduction: A Green non-cited violation (NCV) for an inadequate procedure to control ECCS venting was identified by the NRC.

Description: URI 05000390/2002004-02 documented the inspectors' determination that the procedure for complying with TS SR 3.5.2.3, Verify ECCS Piping Is Full of Water, was inadequate. Instructions or actions regarding duration time and documentation of venting actions were contained in a 'note' as opposed to actual procedure steps and consequently were not consistently implemented. The URI was opened awaiting the completion of the licensee's engineering evaluation of the potential impacts of the gas on the RHR system's ECCS accident mitigation functions. The issue was entered into their corrective action program as PER 02-014475-000. The licensee completed the engineering evaluation and concluded that there would be no significant adverse effects on the ECCS system in performing its design basis functions in this specific case. The inspectors reviewed the specific evaluation and determined that it was adequate.

Assessment: The inadequate procedure had a credible impact on safety in that the procedure failed to detect a significant accumulation of gas in the RHR system which could impact the function of the RHR or other systems to mitigate the consequences of a design basis accident. This finding is more than minor in that it adversely affected the procedure quality attribute of the mitigating system cornerstone and would result in more significant safety concerns if left uncorrected. The inspectors evaluated this finding using MC 0609 and determined that it was of very low safety significance (Green). Although it impacted the mitigating system cornerstone, it did not result in a loss of function per Generic Letter 91-18, did not represent an actual loss of safety function, and was not potentially risk significant due to possible external events.

Enforcement: TS SR 3.5.2.3 requires the licensee to verify that the ECCS piping is full of water every 31 days. TS 5.7.1 requires that written procedures be established, implemented, and maintained as recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978, which includes surveillance tests for ECCS systems. Surveillance procedure 1-SI-63-10-A, ECCS Pumps and Discharge Pipes - Venting Train A, implements the requirements to comply with TS SR 3.5.2.3. Contrary to this, 1-SI-63-10-A was not effectively established or implemented because, on October 9, 2002, the

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licensee found a significant amount of gas greater than that expected over a 31-day surveillance period while venting the cold leg #1 RHR injection line per 1SI-63-10-A, Appendix F. Because this finding is of very low safety significance and because it was entered into the licensee's corrective action program as PER 02-014475-000, this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000390/2004002-01, Inadequate Surveillance Instruction Resulting in Gas Accumulation in ECCS Piping.

#### 1R23 Temporary Plant Modifications

##### a. Inspection Scope

The inspectors reviewed one temporary plant modification against the requirements of SPP-9.5, Temporary Alterations, and SPP-9.4, 10 CFR 50.59 Evaluation of Changes, Test, and Experiments, and verified that the modifications did not affect system operability or availability as described by the TS and UFSAR. In addition, the inspectors verified that the installation of the temporary modification was in accordance with the work package, that adequate configuration control was in place, procedures and drawings were updated, and post-installation tests verified operability of the affected systems.

- TACF 1-03-010-090R1, Change 1-RM-90-106B-A (lower containment radiation monitor) and 1-RM-90-112B-B (upper containment radiation monitor) alert and alarm setpoints

##### b. Findings

No findings of significance were identified.

#### 4. **OTHER ACTIVITIES**

##### 4OA1 Performance Indicator Verifications

Licensee records were reviewed to determine whether the submitted performance indicator (PI) statistics were calculated in accordance with the guidance contained in Nuclear Energy Institute 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 2.

.1 Initiating Events Cornerstone

a. Inspection Scope

The inspectors verified the accuracy of the PI for the number of unplanned transients per 7000 critical hours, which were reported to the NRC. The inspectors reviewed data applicable for the period of January 1, 2003, through December 31, 2003. The inspectors reviewed control room logs and monthly operating reports to determine the number of reactor critical hours. The inspectors also independently calculated the reported values to verify their accuracy.

b. Findings

No findings of significance were identified.

.2 Mitigating Systems Cornerstone

a. Inspection Scope

The inspectors verified the accuracy of the PI for safety system unavailability associated with the AFW system and the emergency AC power system. The inspectors reviewed data applicable for the period of January 1, 2003, through December 31, 2003. The inspectors reviewed monthly samples of control room logs, diesel generator logs, and operator aid computer history files to determine the number of unavailability hours for the systems. The inspectors also independently calculated the reported values to verify their accuracy.

b. Findings

No findings of significance were identified.

4OA2 Identification & Resolution of Problems

.1 Daily Reviews

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished by reviewing daily PER summary reports and attending daily PER review meetings.

## .2 Annual Sample Review

### a. Inspection Scope

The inspectors reviewed PER 02-017703-000, which was associated with the lack of administrative controls or guidance, to ensure that the breaching of doors, hatches, and other architectural openings was evaluated for impact to all associated functions such as those for floods, high energy line break, mission dose, environmental qualification, and keeping radiation exposure as low as reasonably achievable. The licensee's existing breaching controls were focused on fire doors and ventilation boundaries such as the auxiliary building, main control room, and containment annulus pressure boundaries. The report was reviewed to ensure that the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified, prioritized, and completed. The inspectors also evaluated the report against the requirements of the licensee's corrective action program as specified in SPP-3.1, Corrective Action Program, and 10 CFR 50, Appendix B. Additional documents reviewed are listed in the attachment.

### b. Findings and Observations

There were no findings of significance identified. The inspectors determined that the root cause was thorough. For the most part, immediate and long term corrective actions appeared to be adequate. The root cause team performed a barrier analysis and determined that the common cause was a "programmatic deficiency as reflected in upper tier procedures (SPP-7.1), intermediate level implementing documents (MMDP-1), and lower tier procedures and guides (SMMMMD-022, TI-272)." They also determined that there was inadequate interface between these procedures and other processes in evaluating all potential design basis impacts. The root cause team recommended the following corrective actions:

- Revise SPP-7.1, On Line Work Management; MMDP-1, Maintenance Management System; SMMMMD-022, Planner's Guide; and Technical Instruction (TI)-272, Work Control for Non-Transferred Features (Unit 2), to require consideration of all potential impacts from a breach of any type
- Issue a new TI to address requirements for the engineering evaluation of breaches
- Issue a supervisory briefing and site bulletin describing the completed procedure changes, basis, and examples from this PER
- Prepare and deliver a training module to engineering support personnel trained regarding the requirements of the new TI following issuance

The inspectors verified that the corrective actions were completed with the exception of revising SPP-7.1, On Line Work Management, which was canceled. The proposed revision was initially reviewed by another TVA nuclear plant's Plant Operations Review Committee (PORC) for corporate consistency. That PORC decided that it was not appropriate to make the recommended change to SPP-7.1 and determined that the changes to the other procedures would be adequate. The Watts Bar management review committee (MRC) reviewed this decision, agreed with the logic, and canceled the corrective action. The

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inspectors concluded that the remaining procedure changes appeared to be adequate to address work controls for evaluating hazard barrier breaches.

The inspectors determined that the licensee's corrective actions fully addressed work control processes and management/supervision awareness of the issue. The corrective actions (site bulletin, supervisory briefing) also raised the short-term awareness of maintenance personnel to the importance of having evaluations done prior to breaching hazard barriers. However, the inspectors noted that no revisions or additions were made to maintenance personnel or operator training to ensure that long-term awareness was maintained. The inspectors did not identify the occurrence of any performance deficiencies due to this omission.

.3 (Closed) URI 05000390/2003004-04: Inadequate Corrective Action to Control ECCS Venting

a. Inspection Scope

The inspectors reviewed PER 03-014492-000, the operability evaluation and associated calculations for the accumulation of gas found in the discharge line of the B train RHR pump to the suction of the safety injection pumps (SIPs).

b. Findings and Observations

Introduction: A Green NCV for inadequate corrective actions to control ECCS venting was identified by the NRC.

Description: The inspectors had identified that the licensee's corrective actions for gas previously found in the RHR system injection lines were inadequate and opened a URI pending the licensee's completion of an operability evaluation (IR 05000390/2003004, 05000391/2003004). The inspectors reviewed PER 02-014475-000, initiated on October 9, 2002, for gas that was found in ECCS piping after the inspectors identified a venting methodology problem. An attachment to this PER dated November 6, 2002, identified unvented high points in ECCS piping including below the valve seat of 1-FCV-63-11 in the piggyback piping from the discharge of the B train RHR pump to the suction of the SIPs. The inspectors determined that PER 02-014475-000 did not include corrective actions to address the potential gas accumulation in the piggyback piping. On August 28, 2003, the licensee performed ultrasonic testing and identified approximately 5.5 cubic feet of gas in a vertical section of piping below valve 1-FCV-63-11 in the B train piggyback piping. Although the PER had not yet been closed, the inspectors concluded that the time from the date of the attachment to the point of discovery was sufficient in which timely corrective actions should have been identified to prevent the accumulation of gas in the B train piggyback piping. The licensee determined that the most likely source of the gas was from draining the pump casing and associated suction piping on January 14, 2003, in preparation for maintenance on the 1B SIP. Venting following the work was not sufficient to remove the gas. The licensee performed an operability evaluation and determined that the ECCS system and SIPs were operable and capable of performing their safety function with the 5.5 cubic feet of gas. The inspectors reviewed the operability evaluation and

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concluded, after several clarifications, that it was adequate. The cause of this finding impacts the problem identification and resolution cross - cutting area.

Assessment: The inspectors determined that this finding is more than minor because it affected the mitigating systems cornerstone. The inadequate corrective actions for PER 02-014475-000 allowed a significant accumulation of gas which impacted the ability of the ECCS to mitigate the consequences of a design basis accident. The inspectors evaluated this finding using MC 0609 and determined that it was of very low safety significance (Green). Although it degraded the mitigating system cornerstone, it did not represent an actual loss of safety function and was not potentially risk-significant due to external events.

Enforcement: 10 CFR, Part 50, Appendix B, Criterion XVI, Corrective Action, states, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action is taken to preclude repetition. Contrary to this, on August 28, 2003, the licensee's failure to identify and implement adequate corrective actions for PER 02-014475-000 subsequently resulted in the discovery of an accumulation of a significant amount of gas in the RHR discharge to the SIP suction piping from a maintenance activity. Because this finding is of very low safety significance and because it has been entered into the licensee's corrective action program as PER 03-019920-000, this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000390/200402-02, Inadequate Corrective Action to Control ECCS Venting.

#### 4OA3 Event Followup

##### .1 (Closed) LER 05000390/2003-004-00 and LER 05000390/2003-004-01: Emergency Core Cooling System Surveillance Requirement 3.5.2.3 - Verify Piping is Full of Water

On August 28, 2003, the licensee identified 5.5 cubic feet of gas in the B train RHR discharge piping to the suction of the safety injection pumps and centrifugal charging pumps. The inspectors' review of this event was documented in IR 05000390/2003004, 05000391/2003004. The licensee performed extensive ultrasonic testing and venting and verified that the rest of the ECCS piping was full of water. Additional corrective actions included adding new vent points, and revising system operating instructions and work order planning guides. This event resulted from inadequate corrective actions and constituted a violation of TS SR 3.5.2.3 to verify that ECCS piping is full of water. The enforcement aspect of this event is documented in Section 4OA2.3. These LERs are closed.

.2 (Closed) LER 05000390/2004-001-00: Automatic Reactor Trip Due to an Invalid Turbine Trip Signal (P-4)

a. Inspection Scope

The inspectors reviewed the licensee's event critique and PER 04-000064-000, which documented this event in the corrective action program, to verify that the cause of the reactor trip event of January 16, 2004, was identified and that corrective actions were reasonable. The inspectors reviewed plant parameters and verified that timely notifications were made in accordance with 10 CFR 50.72, that licensee staff properly implemented the appropriate plant procedures, and that plant equipment performed as required.

b. Findings

Introduction: A self-revealing Green NCV was identified for failing to follow a surveillance instruction which caused a reactor trip.

Description: On January 16, while performing 1-SI-99-10-B, 31-Day Functional Test of SSPS Train B and Reactor Trip Breaker B, technicians failed to follow the steps of the procedure and caused a reactor trip. The technicians were performing step 24a which verified the position of the RPS Trip Breaker B, P-4 contact, using DC voltage measurements. One technician was holding the multi-meter while a second plugged the test leads into the proper test points on the cabinet. When the multi-meter did not provide the expected indications they switched the multi-meter to read resistance. The technicians then noticed that one of the test leads had fallen out of the multi-meter. The test lead was re-inserted into the multi-meter with the test leads still connected to the test points and the multi-meter set to measure resistance. This resulted in a current path equivalent to P-4 contact closure and activation of the Train B turbine trip bus. The licensee determined that the root cause of the event was a failure of the involved individuals to follow expectations to stop when unexpected conditions occur. A contributor was that the test leads were easily pulled out of the multi-meter because they were not designed to be used with that model.

Risk Analysis: The inspectors determined this finding was more than minor because it resulted in an upset in plant stability by causing a reactor trip. While the finding resulted in an actual trip, the inspectors determined that the finding did not contribute to the likelihood of a primary or secondary system LOCA initiator, did not contribute to a loss of mitigation equipment functions, and did not increase the likelihood of a fire or internal/external flood. Thus, the finding was screened as Green (very low safety significance). The cause of the finding was a human performance error in that procedural requirements were not followed.

Enforcement: TS 5.7.1, Procedures, requires that written procedures be established, implemented, and maintained covering applicable procedures recommended in Regulatory Guide (RG)1.33, Revision 2, Appendix A, February 1978. RG 1.33, Section 8, Procedures for Control of Measuring and Test Equipment and for Surveillance Tests, Procedures, and Calibrations, requires procedures for reactor protection system tests and calibrations. Surveillance Instruction 1-SI-99-10-B, 31-Day Functional Test of SSPS Train B and Reactor Trip Breaker B, Section 7.0, step [24a][a], required technicians to verify direct

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current voltage across TB 4 terminals 1 to 2. Contrary to this, on January 16, 2004, technicians performing step [24a][a] connected a multi-meter set to measure resistance across TB 4 terminals 1 and 2 resulting in a reactor trip. Because this violation is of very low safety significance and has been entered in the licensee's corrective action program under PER 04-000064-000, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000390/2004002-03, Failure to Follow Procedure for Reactor Protection System Testing. This LER is closed.

#### 4OA4 Cross-Cutting Aspects of Findings

Section 4OA3.2 describes a human performance error where licensee staff failed to adequately implement steps of a reactor protection system surveillance procedure. A multi-meter set to measure resistance instead of direct current voltage was connected to reactor protection system test points. Consequently, the reactor tripped on an invalid turbine trip signal.

#### 4OA5 Other Activities

##### .1 NRC Temporary Instruction (TI) 2515/154, Spent Fuel Material Control and Accounting at Nuclear Power Plants

###### a. Inspection Scope

The inspectors completed Phase I and Phase II of Temporary Instruction 2515/154, "Spent Fuel Material Control and Accounting at Nuclear Power Plants".

###### b. Findings

No findings of significance were identified.

##### 2. (Closed) NRC TI 2515/153, Reactor Containment Sump Blockage (NRC Bulletin 2003-01) (Unit 1)

###### a. Inspection Scope

The inspectors reviewed the licensee's activities in response to NRC Bulletin 2003-01, Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors, dated June 9, 2003. The inspection included review of the licensee's 60-day Bulletin response letter, review of interim compensatory measures implemented to reduce the potential risk due to post-accident debris blockage on emergency sump recirculation, and walkdown of the Unit 1 containment prior to restart from the most recent refueling outage to identify if any sources of potential debris existed that could impact the containment recirculation sump performance. The inspectors assessed whether the licensee either (1) performed a plant-specific evaluation of the ECCS and containment spray (CS) recirculation functions for impact of post-accident debris blockage effects, or (2) effectively implemented reasonable compensatory measures.

b. Findings and Observations

By letter dated August 8, 2003, the licensee responded to NRC Bulletin 2003-01. In their response, TVA recognized the potential for sump blockage in the design of Watts Bar and described interim compensatory measures that had been implemented or were planned in accordance with Option 2 as described in the subject Bulletin. These compensatory measures were designed to provide interim actions in order to reduce the risk which may be associated with potentially degraded or nonconforming ECCS and CS recirculation functions until a more detailed evaluation could be completed to verify conformance with applicable regulatory requirements. The inspectors verified the following compensatory measures identified in the licensee's response had been implemented or were planned and scheduled.

(1) Operator training on indications of and response to sump clogging:

The inspectors reviewed ES-1.3, Transfer to Containment Sump, which was revised to provide guidance for enhanced monitoring of the containment sump for blockage and add compensatory actions if sump blockage occurs post-LOCA. The guidance includes the use of an Appendix which is initiated following manual realignment to the sump and directs the recording of baseline data on ECCS and CS pump operating parameters. If continuing degradation is detected, the data will receive an engineering evaluation, and if warranted, the operating crew will be directed to evaluate (via Technical Support Center (TSC) assistance) the stopping of one train. A new step was also added which directs the transition to ECA-1.1, Loss of RHR Sump Recirculation, if ECCS or CS suction is lost. The inspectors also verified that initial and continuing operator training contained guidance associated with the procedure for dealing with a complete loss of ECCS and CS recirculation capability had been provided. The inspectors reviewed guidance to the operators emphasizing the need for continuous monitoring of ECCS recirculation plant parameters to identify degrading conditions and actions to be taken if sump blockage is encountered. The guidance was considered adequate to provide operators a baseline of plant data to allow for effective monitoring throughout the progression of an event. The inspectors also reviewed TI-128, Post Accident Technical Considerations for the TSC, Section 3.6, Containment Sump Operation and Level. The TI provided additional guidance for members of the TSC to evaluate the indications of containment sump clogging and make cautious and informed decisions related to address sump clogging scenarios.

(2) Procedural modifications, if appropriate, that would delay the switchover to containment sump recirculation:

The licensee determined that the revised guidance contained in ES-1.3, Transfer to Containment Sump and TI-128, Post Accident Technical Considerations for the TSC provided adequate guidance for dealing with a complete loss of sump recirculation. However, the licensee planned to review any future Westinghouse Owners Group EOP recommendations, if issued, to determine if any Watts Bar specific procedural changes would be appropriate.

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The licensee considered that requiring operator to take pre-emptive actions during LOCAs was a major change in the philosophy used in the development of their Emergency Operating Procedures and did not consider that additional pre-emptive actions were warranted at this time. The licensee also performed a licensing evaluation which considered pre-emptive actions that delay or reduce ECCS and CS flow during a LOCA. The conclusion of the review indicated that any changes to plant design or operating procedures which implement pre-emptive actions that reduce or delay ECCS and CS flow during a loss of coolant accident could not be made under the allowances of 10 CFR 50.59. A licensing Amendment request would be required for this type of change. To date, the licensee does not have the intent to change their current licensing basis and has implemented a variety of compensatory measures in response to the subject Bulletin (Option 2). As such, the licensee's procedures discussing the consideration for additional pre-emptive actions contain cautions that implementation of such actions may violate accident analysis assumptions and should be not be considered without careful evaluation.

(3) Ensuring that alternate water sources are available to refill the RWST or to otherwise provide inventory to inject into the reactor core and spray into the containment atmosphere:

The licensee determined that no additional changes were necessary to existing plant procedures designed to refill the RWST or provide cooling to the reactor core or containment. The inspectors reviewed guidance in Emergency Operating Procedure ECA-1.1 to initiate Refueling Water Storage Tank (RWST) refill once it has been determined that loss of safety injection recirculation capability exists. The inspectors verified that the procedure provided both a normal RWST makeup from the chemical volume control system blender and an alternate source from the Volume Control Tank.

(4) More aggressive containment cleaning and increased foreign material controls:

The licensee determined that adequate procedural guidance currently existed for containment cleaning and foreign material control. The inspectors reviewed the following procedures and verified that the licensee was adequately implementing the procedures during refueling and other outages. The inspectors also noted recent improvements made to 1-SI-304-2, including inspection of the accumulator room drains. These inspections were previously performed via ASME Section XI inspection requirements. With the exception of a minor implementation issue, the change consolidated the drain inspections which could affect containment sump operation into one procedure focusing on containment sump operability.

- TI-12.07, Containment Access
- SPP-10.7, Housekeeping/Temporary Equipment Control
- TI-61.003, Ice Condenser Loose Debris Log
- 1-SI-304-2, 18-Month ECCS Containment Sump Inspection

In addition, during the last refueling outage, the inspectors performed a walkdown of the Unit 1 containment prior to plant restart following the licensee's containment cleanup activities to verify that debris was not left that could affect the performance of the containment sumps. During this walkdown, the inspectors did not identify any major material conditions which could have adversely impacted the operation of the containment sump. Based on the results of previous inspector walkdowns of containment following refueling outages, the inspectors determined that the licensee had shown improvement in their post-refueling cleanup effectiveness.

(5) Ensuring containment drainage paths are unblocked:

The inspectors reviewed the following procedures and verified that they contained adequate instructions for ensuring that the reactor cavity drains were properly opened prior to the plant entering Mode 4 following a refueling outage to ensure that the drainage path to the containment sump was unblocked. In addition, the inspectors verified the procedures were appropriately implemented during the previous Unit 1 refueling outage.

- 1-SI-304-2, 18-Month ECCS Containment Sump Inspection
- 1-SI-72-3, Containment Refueling Drains
- 1-SI-61-9, 18-Month Ice Condenser Floor Drains Visual Inspection

(6) Ensuring sump screens are free of adverse gaps and breaches:

The inspectors reviewed procedure 1-SI-304-2, 18-Month ECCS Containment Sump Inspection, and verified that it contained adequate guidance for identifying adverse gaps and breaches. In addition, the inspectors verified the procedure was properly implemented during the previous Unit 1 refueling outage.

Based on the above observations, no findings of significance were identified.

#### 4OA6 Meetings

##### .1 Exit Meeting Summary

The inspectors presented the inspection results to Mr. Larry Bryant and other members of licensee management at the conclusion of the inspection on March 31, 2004. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

##### .2 Annual Assessment Meeting Summary

Subsequent to the end of this inspection period, on April 9, 2004, the NRC's Chief of Reactor Projects Branch 6 and the Senior Resident Inspector assigned to the Watts Bar Nuclear (WBN) Plant met with the Tennessee Valley Authority to discuss the NRC's Reactor Oversight Process (ROP) and the Watts Bar annual assessment of safety performance for the period of January 1, 2003 - December 31, 2003. The major topics addressed were: the NRC's assessment program, the results of the Watts Bar assessment, and planned NRC inspection activities. Attendees included Watts Bar site management and staff, corporate staff, and members of some local government emergency preparedness departments

This meeting was open to the public. The presentation material used for the discussion is available from the NRC's document system (ADAMS) as accession number ML041040242. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

ATTACHMENT: SUPPLEMENTAL INFORMATION

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**SUPPLEMENTAL INFORMATION**  
**PARTIAL LIST OF PERSONS CONTACTED**

Licensee

D. Boone, Radiological Control Manager  
L. Bryant, Plant Manager  
J. Cox, Training Manager  
G. Wallace, Chemistry Superintendent  
G. Laughlin, Assistant Plant Manager  
W. Lagergren, Site Vice President  
N. Moon, Engineering and Site Support Manager  
D. Nelson, Business and Work Performance Manager  
P. Pace, Licensing and Industry Affairs Manager  
K. Parker, Maintenance and Modifications Manager  
J. Roden, Operations Superintendent  
T. Wallace, Operations Manager  
J. West, Site Nuclear Assurance Manager

**ITEMS OPENED, CLOSED, AND DISCUSSED**

Opened and Closed

05000390/2004002-01	NCV	Inadequate Surveillance Instruction Resulting in Gas Accumulation in ECCS Piping (Section 1R22)
05000390/2004002-02	NCV	Inadequate Corrective Action to Control ECCS Venting (Section 4OA2.3)
05000390/2004002-03	NCV	Failure to Follow Procedure for Reactor Protection System Testing (Section 4OA3.2)

Closed

05000390/2002004-02	URI	Inadequate surveillance instruction resulting in gas accumulation in ECCS piping (Section 1R22)
05000390/2003004-04	URI	Inadequate Corrective Action to Control ECCS Venting (Section 4OA2.3)
05000390/2003-004-00	LER	Emergency Core Cooling System Surveillance Requirement 3.5.2.3 - Verify Piping is Full of Water (Section 4OA3.1)
05000390/2003-004-01	LER	Emergency Core Cooling System Surveillance Requirement 3.5.2.3 - Verify Piping is Full of Water (Section 4OA3.1)

05000390/2004-001-00

LER Automatic Reactor Trip Due to an Invalid Turbine Trip Signal (P-4) (Section 4OA3.2)

05000390/2515/154

TI Reactor Containment Sump Blockage ( NRC Bulletin 2003-01 (Section 4OA5.2)

**LIST OF DOCUMENTS REVIEWED**Section 1R04

- SOI-3.02, Auxiliary Feedwater System
- N3-32-4002, Compressed Air System description
- 3-OT-SYS032B, Auxiliary Control Air System lesson plan
- SOI-32.02, Auxiliary Air System
- SOI-30.06, Auxiliary Building Gas Treatment System
- SOI-65.02, Emergency Gas Treatment System
- SOI-31.01, Control Building HVAC System
- PER 04-810140-000, NRC-identified problem of an incorrect TS LCO condition entered in CR logbook

Section 1R06

- Updated Final Safety Analysis Report (UFSAR) Sections 2.4.14, 3.4, 3.6, 3.8.1, 3.8.2, and 3.8.4, including related figures and drawings
- Design Criteria WB-DC-40-29, Flood Protection Provisions
- Abnormal Operating Instruction (AOI)-7.01, Maximum Probable Flood, Revision 14
- AOI-7.02, Flood Mode Head Removal and Cavity Filling, Revision 4
- AOI-7.03, Flood Mode CVCS and WDS Tank Filling Instructions, Revision 3
- AOI-7.06, Alignment of HPFP Water to the Steam Generators, Revision 3
- Maintenance Instruction (MI)-17.001, Flood Preparation - Ventilation of Steam Valve Rooms, Revision 5
- MI-17.002, Flood Preparation - Opening of Aux Bldg Railroad Hatchways and Access Door, Revision 7
- MI-17.004, Movement of Equipment, Flood Mode Preparation, Revision 7
- MI-17.005, Flood Preparation Removal of Cold Leg Accumulator Vent Blind Flanges, Revision 6
- MI-17.006, Flood Preparation - Disconnection of Battery Banks, Revision 4
- MI-17.007, Flood Preparation - Temporary Lighting for Reactor and Auxiliary Buildings, Revision 6
- MI-17.008, Flood Preparation Installation of Reactor Cavity Seal, Revision 5
- MI-17.009, Flood Preparation - Removal of Refueling Cavity Canal Gates, Revision 4
- MI-17.010, Flood Preparation Cutting of Sound - Powered Telephone Cables, Revision 4
- MI-17.011, Flood Preparation - Filling CVCS Hold-Up, Revision 5
- MI-17.012, Flood Preparation - Securing Sampling Valves in the Open Position, Revision 6
- MI-17.015, Main Control Board Modifications for Flood Mode Operation, Revision 1
- MI-17.017, Flood Preparation - Drain Collector Tanks (Flooding of Drain Collector Tanks through Passive Failure Connection), Revision 5
- MI-17.018, Flood Preparation - High Pressure Fire Protection System Spool, Revision 8
- MI-17.019, Flood Preparation - Auxiliary Charging System Spool Piece, Revision 6
- MI-17.020, Flood Preparation - Sample Heat Exchanger Spool Pieces, Revision 5

- MI-17.021, Installation of Spool Pieces Between ERCW System and Component Cooling System, Revision 6
- MI-17.022, Flood Preparation - Installation of Spool Pieces Between SFPC System and RHR System, Revision 5
- MI-17.023, Flood Preparation - Reactor Coolant Drain Tank Spool Pieces, Revision 5
- MI-17.024, Flood Preparation - Ice Condenser Cooling Spool Piece, Revision 5
- MI-17.026, Flood Preparation - Fuel Transfer Tube Blind Flange Removal and Installation of Refueling Canal Drain Covers, Revision 5
- MI-17.027, Flood Preparation - Blocking of Ice Condenser Glycol Valves, Revision 5
- MI-17.028, Flood Preparation - Block Open Cold Leg Accumulator Drains to Reactor Coolant Drain Tank Valves, Revision 6
- MI-17.029, Flood Preparation Installation of a Discharge Line from Reactor Bldg Floor and Equipment Drain Sump Pump, Revision 8
- MI-17.033, Flood Preparation - Install Blind Flanges on HPFP Pump Discharge Relief Valves, Revision 6
- MI-17.035, Flood Preparation - Removal of CRDM Missile Shield Sections PC-1 and PC-2, Revision 6
- MI-17.036, Flood Mode - Steam Generator Primary Manway Closure, Revision 4
- Preventive Maintenance (PM)1-PIPE-074-B, Flood Mode Spool Piece Storage Inspection, File 01, Revision 4
- PM 0-PMP-040-0065MH1, 1E Manhole and Sump Inspection, File 01, Revision 9
- Problem Evaluation Report (PER) 03-000695-000, FSAR and EPIP 6 do not compliment each other
- PER 03-001874-000, The river systems operations notification directory contains inaccurate technical information
- PER 03-001948-000, Walkdown with NRC inspector revealed that the location of the boat used in flood mode preparation describe in MI-17.004 was not correct
- PER 03-006181-000, Worker bumped level switch in 1C charging pump room which caused alarm in main control room indicating that the building was flooded
- PER 03-011901-000,A and B plants failed at the sewage treatment plant due to the flooding conditions during heavy rain
- PER 03-012318-000, Item #03-006 on the erosion/storm water control inspection record, involving flooding west of the sewage treatment plant, has been open for three months and is not complete
- PER 03-015658-000, 0-SUMP-040-1241A and 0-SUMP-040-0065MH33 were discovered to be flooded
- PER 03-016337-000, Large amounts of water discharged while working WO 03-03846-000
- PER 03-017894-000, Conduit 1PP2188A found to be full of water

Section 1R12

- WO 02-010759-000, Check pressure regulator on 1-LCV-003-0172, TDAFW pump to SG #3 level control
- PER 03-015750-000, 1-FCV-1-29 (#4 main steam isolation valve) failed to fully close
- PER 02-010744-000, Licensee-identified problem with failure to follow PM instructions resulting in a failure to satisfy valve stroke time requirements due to an incorrect setting on a pressure regulator (PREG)
- WO 00-013631-000, Replace PREG on 1-LCV-003-172
- WO 01-008815-000, Replace PREG on 1-LCV-003-173
- Maintenance Rule cause determination evaluation for PER 03-015750-000

Section 1R14

- E-0, Reactor Trip or Safety Injection
- ES-0.1, Reactor Trip Response

Section 1R22

- 1-SI-3-122, 92 Day Trip Actuating Device Operational Test of Auxiliary Feedwater Pump 1B-B Suction Header Pressure Switches
- WBN-VTD-1075-0080, Installation, Operation and Maintenance Instructions for 3 HMTA-9 Stage Auxiliary Feed Water Pumps
- Setpoint and Scaling Document (SSD)-1-PS-3-144A-S
- SSD-1-PS-3-144B-S
- SSD-1-PS-3-144D-S
- SPP-2.2, Administration of Site Technical Procedures
- TI-100.001, Inservice testing of pumps
- SPP-9.1, ASME Section XI
- N3-30RB-4002, Reactor Building Ventilation System
- TS 3.6.10 Air Return System (ARS)
- N3-3B-4002, AFW System Description
- WBN-VTD-I075-0080, TDAFW vendor manual
- 02-PV-005, Pump Reference Value Worksheet for 1-PMP-003-1A
- SOI-3.02, Auxiliary Feedwater System

Section 4OA2

- SPP-7.1, On Line Work Management
- MMDP-1, Maintenance Management System
- SMMMMD-022, Planner's Guide
- TI-64, Breaching Hazard Barriers
- T-272, Work Control for Non-Transferred Features (Unit 2)
- PER 03-001241-000, RIS 2001-09, Control of Hazard Barriers, was not effectively tracked to ensure proper actions taken