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

July 14, 2000

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 NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT NO. 50-390/00-03 AND 50-391/00-03

Dear Mr. Scalice:

On June 17, 2000, the NRC completed an inspection at your Watts Bar 1 & 2 reactor facilities. The enclosed report presents the results of this inspection, which were discussed with Mr. W. Lagergren and other members of your staff.

The 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 a selective examination of procedures and representative records, observations of activities, and interviews with personnel.
The NRC identified one issue of very low safety significance that has been entered into your corrective action program and is discussed in the summary of findings and in the body of the attached inspection report. The issue was determined to involve a violation of NRC requirements, but because of its very low safety significance the violation is not cited. If you contest this noncited violation, 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.

In accordance with 10 CFR 2.790 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 Public Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

***/RA/***

Paul E. Fredrickson, 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 w/Attachment

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

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|---|---|
| Docket Nos: | 50-390, 50-391 |
| License Nos: | NPF-90 and Construction Permit CPPR-92 |
| Report No: | 50-390/00-03, 50-391/00-03 |
| Licensee: | Tennessee Valley Authority (TVA) |
| Facility: | Watts Bar Nuclear Plant, Units 1 & 2 |
| Location: | 1260 Nuclear Plant Road<br>Spring City TN 37381 |
| Dates: | April 2, 2000 through June 17, 2000 |
| Inspectors: | P. Van Doorn, Senior Resident Inspector<br>D. Rich, Resident Inspector<br>R. Carrion, Project Engineer<br>D. Jones, Senior Health Physicist<br>P. Taylor, Senior Project Engineer |
| Approved by: | P. Fredrickson, Chief<br>Reactor Projects Branch 6<br>Division of Reactor Projects |

Enclosure

# SUMMARY OF FINDINGS

The report covers an eleven-week period of resident inspection in accordance with the baseline program in the reactor safety area. In addition, it includes inspections conducted by regional project inspectors, and a regional radiation specialist.

The significance of issues is indicated by their color (green, white, yellow, red) and was determined by the NRC's Significance Determination Process, as discussed in the attached summary of the NRC's Reactor Oversight Process.

Cornerstone: Mitigating Systems

- Green. A non-cited violation of Technical Specification 5.7.1.1 was identified for an inadequate chemistry procedure utilized for the prevention of Asiatic clam infestations. Partial blockage of piping for containment spray and residual heat removal pump room coolers was discovered during licensee troubleshooting of a low flow condition.

  The finding had very low risk significance because licensee analysis showed that the coolers remained functional (Section 1R19).

## Report Details

Unit 1 operated at or near 100 percent power for the entire inspection period. Unit 2 remained in a suspended construction status.

### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Preparations

a. Inspection Scope

The inspectors verified that the licensee appropriately implemented preparations for protecting plant equipment during a tornado warning in accordance with Abnormal Operating Instruction 8, "Tornado Watch or Warning," Revision 17.

b. Issues and Findings

No findings were identified.

1R04 Equipment Alignment

a. Inspection Scope

The inspectors conducted 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 walkdowns included verification of correct system lineups and critical components in accordance with the procedures noted to identify any discrepancies which could affect operability of the redundant train or backup system.

- Emergency Diesel Generator 1A, (System Operating Instruction, (SOI) 82-01, Revision 39),
- Emergency Diesel Generator 1B, (SOI 82-02, Revision 38),
- Chemical and Volume Control System 1B, (SOI 62.01, Revision 29),
- Residual Heat Removal (RHR) System 1B, (SOI 74.01, Revision 25),

b. Issues and Findings

No findings were identified.

1R05 Fire Protection Tours

a. Inspection Scope

The inspectors conducted tours of areas important to reactor safety, listed below, to evaluate, 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.

- Room 755.0-C12, Main Control Room
- Room 713.0-A1, Auxiliary Building Corridor
- Room 757.0-A2, 6.9KV/480V Shutdown Board Room A
- Room 708.0-C1, Unit 1 Auxiliary Instrument Room
- Room 757.0-A5, 480V Shutdown Board Room 1B
- Room 772.0-A14, 125V Vital Battery III Room

In addition, fire loading analysis calculation EMP-DOM-012990 for room 757.0-A2 was reviewed to assure that items located in the room had been accounted for. Also, Design Change Notices 39890-A and 38924-A, associated with items located in the room since the original calculation was completed, were reviewed.

b. Issues and Findings

No findings were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed operators in the plant's simulator during licensed operator retraining including scenarios for two crews. The inspector verified that critiques were thorough. In addition, the inspectors verified that the training program included risk-significant operator actions, emergency plan implementation, and lessons learned from previous plant experiences.

b. Issues and Findings

No findings were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors sampled portions of selected structures, systems or components (SSCs), listed below, as a result of performance-based problems, to assess the effectiveness of maintenance efforts that apply to scoped SSCs in accordance with Technical Instruction 119, "Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting," Revision 9. Reviews focused, as appropriate, on (1) maintenance rule scoping in accordance with 10 CFR 50.65; (2) characterization of failed SSCs; (3) safety significance classifications; (4) 10 CFR 50.65 (a)(1) or (a)(2) classifications; and (5) the appropriateness of performance criteria, goals, and corrective actions for SSCs.

- Emergency Gas Treatment System, Problem Evaluation Report (PER) WBPER 00-2190-000
- Charging Pump 1A Room Cooler, PER WBPER 00-5478-000
- Control Rod Drive Cooler Fan, PER WBPER 00-5910-000

b. Issues and Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed Technical Instruction 124, "Equipment to Plant Risk Matrix," Revision 2, and evaluated, as appropriate for the selected SSCs listed below, (1) the effectiveness of the risk assessments performed before maintenance activities were conducted; (2) the management of risk; (3) that, upon identification of an unforseen 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.

- Emergency Diesel Generator 1A
- Emergency Diesel Generator 1B
- Solid State Protection System
- Centrifugal Charging Pump 1A
- RHR System 1A
- Common Service Station Transformer A and D
- Common Service Station Transformer B and C
- Standby Main Feedwater Pump
- Containment Spray (CS) Pump 1B and RHR Pump 1B Room Coolers

b. Issues and Findings

No findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed selected operability evaluations affecting risk significant mitigating systems, listed below, to assess, as appropriate, the technical adequacy of the evaluations; whether compensating measures were appropriate and controlled; and where continued operability was considered unjustified, the impact on Technical Specification (TS) LCOs and the risk significance.

- Essential Raw Cooling Water (ERCW) Supply to Auxiliary Feedwater Telltale Drain, PER WBPER 00-5909-000

- Hydrogen Ignitors, PERs WBPER 00-5721-000 and -6392-000
- RHR Mini Flow Valve 1-MVOP-074-12A, PER WBPER 00-6482-000
- Emergency Diesel Generator 1A Air Line, PER WBPER 00-6712-000
- CS and RHR 1B Room Cooler Clam Infestation, PERs WBPER 00-6932-000 and -6949-000

b. Issues and Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed post maintenance test (PMT) activities 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; (8) and that equipment was returned to the status required to perform its safety function.

- Emergency Diesel Generator 1B Preventive Maintenance
- Safety Injection Pump 1B Room Cooler Preventive Maintenance
- Emergency Diesel Generator 1A Preventive Maintenance
- ERCW Pump EB Clutch Replacement
- Emergency Diesel Generator 2B Air Start Valve 2-FCV-082-260 Corrective Maintenance
- Component Cooling Pump 1B Preventive Maintenance
- CS Pump 1B Room Cooler Corrective Maintenance
- Standby Main Feedwater Pump Preventive Maintenance

b. Issues and Findings

On May 8, 2000, the licensee performed preventive maintenance on the CS 1B pump room cooler. Subsequent post maintenance testing of ERCW flow discovered that the normal design flow of 20 gpm had been reduced to 6 gpm. Subsequent troubleshooting discovered that Asiatic clam infestation had blocked most of a common pipe to the CS and RHR 1B pump room coolers. The licensee cleaned the piping via removal of valve internals and the cutting of some piping. Appropriate TS actions were entered and a PER was initiated to document operability reviews and corrective actions.

Biocide injection for control of clam larvae was performed in accordance with Chemistry Procedure CM 4.04, Revision 9, BCDMH Injections for Control of Clams, Slime, and MIC. Licensee reviews disclosed that the season for clam larvae had lasted longer than that of the previous year and that the procedure had not been adjusted to provide treatment for a longer period later in the year.

The licensee determined through analysis that the coolers would have functioned to provide sufficient cooling for equipment environmental concerns. The inspector reviewed the licensee's evaluation and agreed with the conclusions. Because the coolers would have been functional, the problem was considered to be of very low risk.

The finding was determined to be Green using Phase 1 of the Significance Determination Process.

Procedure CM 4.04, Revision 9, was inadequate in that it had not been adjusted to reflect the increase in the clam larvae season from the previous year. This procedure deficiency is a violation of TS 5.7.1.1, which requires procedures to be established and maintained that are recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Appendix A includes chemistry procedures. This violation is being treated as a non-cited violation, consistent with Section VI.A of the Enforcement Policy, issued on May 1, 2000 (65 FR 25368), and is identified as NCV 50-390/00-03-01: Inadequate Chemistry Procedure to Prevent Asiatic Clam Infestation. The violation is in the licensee's corrective action program as PER WBPER-00-6894-000.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors witnessed surveillance tests and reviewed test data of selected risk-significant SSCs, listed below, to assess, as appropriate, whether the SSCs met TS, updated final safety analysis report (UFSAR), and surveillance instruction requirements, and to determine if the testing effectively demonstrated that the SSCs were operationally ready and capable of performing their intended safety functions.

- 0-SI-82-17-A, 184 Day Fast Start and Load Test DG 1A-A, Revision 0
- 0-SI-82-18-B, 184 Day Fast Start and Load Test DG 1B-B, Revision 0
- 1-SI-63-901-B, Safety Injection Pump 1B-B Quarterly Performance Test, Revision 7
- 1-SI-70-901-B, Component Cooling System Pump 1B-B Quarterly Performance Test, Revision 5
- 1-SI-99-10-B, 31 Day Functional Test of the Solid State Protection System (SSPS) Train B and Reactor Trip Breaker B, Revision 6
- 0-SI-215-42-B, DG 1B-B 18 Month Service and Battery Charger Test, Revision 6

b. Issues and Findings

No findings were identified.

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed an emergency drill on May 25, 2000, to evaluate drill conduct and the adequacy of the licensee critique.

b. Issues and Findings

No findings were identified.

## 2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control

a. Inspection Scope

The inspectors reviewed the access controls for high radiation areas (HRAs), locked high radiation areas (LHRAs), and very high radiation areas (VHRAs). Incorporation of those controls into selected radiation work permits (RWPs) typically used for work in those areas was also reviewed. Adherence to RWP specified access controls by radiation workers and radiation protection technicians working at two job sites was observed by the inspectors. The entrances to 13 HRAs and/or LHRAs in the auxiliary building were evaluated for proper locking and posting for the radiological conditions present. The inspector also performed independent verification of the dose rates which were recorded on postings at the entrances to three HRAs. The effectiveness of characterization and resolution of problems for selected access control related issues identified by the licensee during 2000 (year to date) was evaluated by the inspectors.

b. Issues and Findings

No findings were identified.

## 4 OTHER ACTIVITIES

4OA5 Other

(Closed) Temporary Instruction (TI) 2515-144: Performance Indicator Data Collecting and Reporting Process Review. The inspectors reviewed the licensee's process utilized for the collection and reporting of data used to derive quarterly performance indicators reported to the NRC to verify that appropriate NRC/NEI guidance was being implemented. No findings were identified and documented through this review.

4OA6 Management Meetings

.1 Exit Meeting Summary

The inspectors presented the inspection results to Mr. W. Lagergren and other members of licensee management at the conclusion of the inspection on June 16, 2000. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Plant Performance Review and Reactor Oversight Program Meetings

On June 12, 2000, the NRC presented the results of the Plant Performance Review for Watts Bar for the period of February 1, 1999 through January 31, 2000. This meeting was open to the public. During the evening of June 12, 2000, a public meeting was held at the Rhea County Courthouse in Dayton, TN to discuss the NRC's revised Reactor Oversight Program used to conduct safety inspections and assess licensee performance.

## PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Beecken, Maintenance and Modifications Manager
D. Boone, Radiological Control Manager
L. Bryant, Assistant Plant Manager
S. Casteel, Radiological and Chemistry Control Manager
L. Hartley, Maintenance Rule Coordinator
M. King, Acting Chemistry Manager
D. Kulisek, Operations Manager
W. Lagergren, Plant Manager
D. Nelson, Business and Work Performance Manager
P. Pace, Licensing and Industry Affairs Manager
R. Purcell, Site Vice President
J. Roden, Operations Superintendent
J. West, Site Nuclear Assurance Manager

NRC

P. Van Doorn, Senior Resident Inspector
D. Rich, Resident Inspector

## ITEMS OPENED AND CLOSED

Opened and Closed

| | | |
|---|---|---|
| 50-390/00-03-01 | NCV | Inadequate Chemistry Procedures to Prevent Asiatic Clam Infestation (1R19). |

# NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

| Reactor Safety | Radiation Safety | Safeguards |
|---|---|---|
| ● Initiating Events | ● Occupational | ● Physical Protection |
| ● Mitigating Systems | ● Public | |
| ● Barrier Integrity | | |
| ● Emergency Preparedness | | |

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.

Attachment