March 26, 1999

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: NRC INTEGRATED INSPECTION REPORT NO. 50-390/99-01 AND 50-391/99-01

Dear Mr. Scalice:

This refers to the inspection conducted on January 17, 1999 - February 27, 1999, at the Watts Bar facility. The enclosed report presents the results of this inspection.

During the inspection period, your conduct of activities at the Watts Bar facility was generally characterized by safety-conscious operations, sound engineering and maintenance practices, and careful radiological work controls.

Based on the results of this inspection, the NRC has determined that three violations of NRC requirements occurred. These violations are being treated as Non-Cited Violations (NCVs), consistent with Appendix C of the Enforcement Policy. These NCVs are described in the subject inspection report. If you contest the violation or severity level of these NCVs, 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 a copies to the Regional Administrator, Region II, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

Should you have any questions concerning this letter, please contact us.

Sincerely,

(Original signed by Paul E. Fredrickson)

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

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-390, 50-391
License Nos:	NPF-90 and Construction Permit CPPR-92
Report Nos:	50-390/99-01, 50-391/99-01
Licensee:	Tennessee Valley Authority
Facility:	Watts Bar, Units 1 and 2
Location:	1260 Nuclear Plant Road Spring City TN 37381
Dates:	January 17 through February 27, 1999
Inspectors:	P. Van Doorn, Senior Resident Inspector D. Rich, Resident Inspector T. Morrissey, Project Engineer D. Jones, Reactor Engineer (Sections R1.3, R1.4 and R1.5) R. Gibbs, Maintenance Inspector (Section M8) R. Moore, Reactor Engineer (Sections E2 and E8.1) C. Smith, Reactor Engineer (Sections E2 and E8.1)
Approved by:	P. E. Fredrickson, Chief Reactor Projects Branch 6 Division of Reactor Projects

Enclosure

EXECUTIVE SUMMARY

Watts Bar Nuclear Power Plant, Units 1 and 2
NRC Inspection Report 50-390/99-01, 50-391/99-01

This integrated inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a six-week period of resident inspection with assistance from a project engineer. In addition, a procurement engineering inspection, a regional radiological effluents inspection, and a Maintenance Rule followup inspection were conducted.

Operations

- The conduct of operations was professional and safety-conscious. Requirements were met for control room conduct and other areas reviewed such as turnovers, tagouts, documentation, staffing, and assistant unit operator activities (Section O1.1).

- A detailed engineered safety feature system walkdown of the residual heat removal (RHR) system was performed. System lineup was in accordance with design basis documents and the system engineer was knowledgeable of system design, operation, and maintenance. The RHR system was in good material condition and support systems were operational. System performance met Maintenance Rule performance criteria (Section O2.1).

- A continued self-critical and thorough approach to problems was demonstrated during self-assessment activities. Corrective action plans were thorough. Beneficial findings were identified by the Nuclear Assurance department (Section O7.1).

Maintenance

- Nine maintenance and surveillance activities were adequately performed, and Maintenance provided good support to resolve plant equipment or component problems. Work performed was typically well documented (Section M1.1).

Engineering

- Engineering personnel effectively contributed to management review committees. Evaluations of equipment problems were thorough and technically viable (Section E1.1).

- Two examples of failure to follow procedure for procurement of replacement parts were identified as a non-cited violation (NCV). Special instructions for tagging differential pressure switches were not followed and performance of a specified post installation test to qualify a commercial grade dedicated replacement part was not verified (Sections E2.1 and E2.2).

- The Procurement Engineering Group provided adequate technical evaluations to verify acceptability of substitution for obsolete parts (Section E2.1).

- An NCV related to inadequate design control for failure to use spring charging motor inrush current in battery sizing calculation was identified in connection with replacements for obsolete spring charging motors (Section E2.1).
- Appropriate acceptance criteria were specified and verified for receipt of safety related parts (Section E2.1).

- Self-assessments of the replacement parts procurement process were adequate (Section E2.1).

- Resolution of receipt inspection discrepancies was effective, although one example was identified in which the extent of condition review was deficient (Section E2.1).

- The program implementation for commercial grade dedication was adequate. Technical evaluations for commercial grade dedications identified appropriate component critical characteristics and documented these as acceptance criteria (Section E2.2).

- An NCV was identified for having an inadequate procedure for evaluation of heavy weight ice baskets (Section E8.2).

Plant Support

- Radiological controls were adequate. Personnel were attentive and followed requirements. Good management oversight of chemistry results was provided, and regulatory requirements were being met (Section R1.1).

- Radiological controls were well planned and strictly adhered to during entry into the fuel transfer canal for equipment inspection and periodic maintenance. Extra personnel and equipment were staged for personnel safety (Section R1.2).

- An effective program had been implemented for maintaining radioactive effluent monitoring instrumentation in an operable condition and for performing the required surveillances to demonstrate their operability (Section R1.3).

- The surveillance requirements for demonstrating operability of the meteorological monitoring instrumentation were met and the performance with respect to collection of meteorological data improved during the fourth quarter of 1998 (Section R1.4).

- The material condition of the control room emergency ventilation system was well maintained and the surveillances for demonstrating operability of the systems were being performed as required (Section R1.5).

- Security personnel performed acceptably and barriers and zones were well maintained (Section S1.1).

Report Details

Summary of Plant Status

Unit 1 began this inspection period operating in Mode 1 at 91 percent reactor power in coastdown to the Unit 1 Cycle 2 refueling outage. Operation in coastdown continued until February 27, 1999, when the unit was shutdown for the outage.

Unit 2 remained in a suspended construction status.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

The inspectors conducted frequent inspections and reviews of ongoing plant operations. This included routine control room (CR) observations, crew turnover observations, review of logs, review of standing and night orders, CR staffing, review of tagouts, attendance at the daily planning meeting, and observation of assistant unit operator activities.

The conduct of operations was professional and safety-conscious. Shift supervision was generally adequate, but the inspectors noted one occasion when the shift manager was not present for the mid-shift brief. Requirements were met for CR conduct and other activities reviewed.

O2 Operational Status of Facilities and Equipment

O2.1 Engineering Safety Feature System Walkdown (71707)

a. Inspection Scope (71707)

The inspector performed a detailed walkdown of portions of the residual heat removal (RHR) system and interviewed the system engineer. The inspector reviewed the Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TS), System Design Description N3-74-4001, system drawings, and System Operating Instruction (SOI) 74.01, Residual Heat Removal System, Revision 20. The inspector also reviewed Technical Instruction (TI)-119, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting, 10 CFR 50.65, Attachment 19, Revision 6, and the RHR system status reports for first quarter fiscal year 1999.

b. Observations and Findings

The system lineup was in accordance with system drawings and SOI-74.01 and was consistent with the UFSAR and the system design description. Design changes made

within the last two years did not affect system drawings. System pumps, valves, piping, insulation, support systems, and hangers were in good condition, and the area around system components was clean and free of ignition sources. Electrical cabinets were free of debris, and no jumpers were visible. System valve control logic was consistent with the UFSAR. Support systems were operational.

TI-119 described Maintenance Rule performance criteria for the RHR system. The RHR system status report documented system performance which met established Maintenance Rule performance criteria. The system engineer was knowledgeable of system design, lineup, Maintenance Rule application, and resolution of problems.

c. Conclusions

The RHR system lineup was in accordance with SOI-74.01 and with design basis documents, and the system engineer was knowledgeable of system design, operation, and maintenance. The RHR system was in good material condition and support systems were operational. System performance met Maintenance Rule performance criteria.

O7 Quality Assurance in Operations

O7.1 Licensee Self-Assessment Activities (40500)

The inspectors reviewed various self-assessment activities which included the following:

- Observation of Management Review Committee (MRC) meetings;
- Review of selected problem evaluation reports (PERs) for adequacy of corrective actions and implementation of procedural requirements;
- Observation of one Plant Operations Review Committee (PORC) meeting; and,
- Review of Nuclear Assurance (NA) department activities and findings.

A continued self-critical and thorough approach to problems was demonstrated at the committee meetings. Corrective action plans were thorough. Beneficial findings were identified by the NA department.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62707, 61726)

The inspectors observed preplanned and emergent maintenance activities including all or portions of the following work orders (WOs), maintenance instructions (MIs) and surveillance instructions (SIs) and reviewed associated documentation:

- 1-TRI-47-3, Main Turbine Steam Inlet Valve Testing, Revision 0
- WO 98-016562, Repair Valve 1-FE-61-193
- WO 98-002445-002, Replace 1C Condensate Booster Pump Flexible Coupling
- 1-TRI-62-902, ASME XI Inservice System Pressure Test CVCS Outside Containment, Revision 2
- WO 98-009458-000, Inspect 1A Containment Spray Pump Room Cooler Per 1-PMCL-30-0177
- MI-79.001, Fuel Handling Equipment Periodic Inspection, Revision 5
- 1-TRI-47-1, Main Turbine Oil Trip Device Quarterly Test, Revision 3
- WO 98-003502-000, Diesel Engine 1A2 Governor Adjustment
- WO 97-006492-047, Perform MI-57.250, 18 Month Periodic Testing of 1E Molded Case Circuit Breakers with 1E Loads

b. Observations and Findings

The inspectors observed the activities identified above and determined that personnel involved in the work were qualified and knowledgeable in the tasks being performed. The work instructions were observed being followed, and problems, if encountered during the performance of the work, were properly dispositioned. Where appropriate, radiation control measures were in place.

c. Conclusions

Nine maintenance and surveillance activities were adequately performed, and Maintenance provided good support to resolve plant equipment or component problems. Work performed was typically well documented.

M5 Maintenance Staff Training and Qualification

M5.1 Test Director Qualification

a. Inspection Scope (62707)

The inspector reviewed maintenance WO 980759100, Channel Calibration for the Shield Building Vent Radiation Monitor Loop 2-LPR-90-400 and WO 960431500, Calibration of the Condenser Vacuum Vent Radiation Monitor Loop 1-LPR-90-0404.

b. Observations and Conclusions

Technicians were appropriately qualified for the work on loop 1-LPR-90-0400. However, the inspector found that one of the several technicians who had been assigned as a test director for work on loop 2-LPR-90-400, was not formally qualified for this task and thus could not act as a test director. The licensee demonstrated that this technician had previous experience with loop 2-LPR-90-400 and was technically knowledgeable but no documentation of his formal qualification was available. Licensee management subsequently verified the technician's knowledge level and qualified him as a test director for work on loop 2-LPR-90-400.

UFSAR, Section 13.1.3, Qualification Requirements for Nuclear Facility Personnel, includes TVA instrument mechanics in the ANSI/ANS 3.1-1981 position described as "technician." The TVA Nuclear Quality Assurance Plan, TVA-NQA-PLN89-A, Appendix B, commits to the requirements in ANSI/ANS 3.1-1981 for personnel selection and training in the development of programs and procedures for the indoctrination, training, qualification, and certification program. 10CFR50, Appendix B, Criterion V, requires activities affecting quality be prescribed by documented instructions and accomplished in accordance with these instructions. Maintenance department Procedure MMDP-1, Maintenance Management System, Revision 0, Section 3.9.1.D, Task Qualification, states, in part, "Ensure tasks are assigned to qualified craftperson in accordance with the task matrix..." The assigned test director was not on the task matrix for loop 2-LPR-90-400.

c. Conclusions

A technician was assigned as a test director for maintenance on radiation monitor loop 2-LPR-90-400 but was not formally qualified for the task. The safety significance of this failure is low because the licensee was able to demonstrate the technical

competence of the technician. This failure constitutes a violation of minor significance and is not subject to formal enforcement action.

M8 Miscellaneous Maintenance Issues (62706)

M8.1 (Closed) Violation 50-390/98-05-01: Failure to Include all SSCs Within the Scope of the Maintenance Rule. This violation identified two examples which included six structure, system and component (SSC) functions; which should have been included in the scope of the licensee's Maintenance Rule program, but were not included.

The licensee's initial response, (TVA to NRC letter dated August 28, 1998), included a partial denial of the violation and provided the technical basis for the denial. The response also requested that two of the SSC function examples be re-classified as non-cited violations in accordance with the NRC's enforcement policy. The NRC's response to the licensee's letter, (NRC to TVA letter dated November 3, 1998), withdrew one of the SSC functions as an example of the violation, and re-classified two of the SSC function examples as Non-Cited violations (NCVs) in accordance with the NRC's enforcement policy. The other three function examples remained valid as examples of the violation. This letter also provided additional clarification as to why these function examples were violations of the Maintenance Rule. The licensee's final response, (TVA to NRC letter dated December 2, 1998), provided appropriate corrective actions. The inspector reviewed the results of the licensee's corrective actions, including expert panel meeting minutes, emergency operating procedure review results, and TI-119, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting, Revision 7, to verify proper closure of this violation. The licensee's corrective actions were appropriate and complete.

M8.2 (Closed) Violation 50-390/98-05-03: Failure to Adequately Monitor SSCs Under the Maintenance Rule. This violation identified that the licensee was not monitoring all unavailability associated with system surveillance testing under the Maintenance Rule as required.

The licensee's initial response, (TVA to NRC letter dated August 28, 1998), included a denial of the violation and provided the technical basis for the denial. The NRC response to the licensee's letter, (NRC to TVA letter dated November 3, 1998), restated the NRC position on unavailability and provided the technical justification for that position. The licensee's final response, (TVA to NRC letter dated December 2, 1998), provided appropriate corrective actions. The inspector reviewed the results of the licensee's corrective actions; including expert panel meeting minutes, Maintenance Rule data for several risk significant systems, and SPP-6.6, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting-10CFR50.65, Revision 2, to verify proper closure of this violation. The licensee's corrective actions were appropriate and complete.

III. Engineering

E1 Conduct of Engineering

E1.1 General Observations (37551)

The inspectors observed engineering support activities for emergent issues as well as the proceedings of the MRC and PORC. Engineering personnel effectively contributed to management review committees. Evaluations of equipment problems were thorough and technically viable.

E2 Engineering Support of Facilities and Equipment

E2.1 Safety Related (10 CFR Part 21) Procurement (37550)

a. Inspection Scope

The inspectors reviewed procurement engineering activities related to the purchase and receipt of safety related replacement parts. The areas of review included 10 CFR Part 21 (quality assurance (QA) 1) replacement parts, approved suppliers list (ASL) verification, acceptable substitutes, receipt inspection acceptance criteria and verification, resolution of receipt inspection deficiencies, and self-assessment. The inspection included a sample review of the licensee's performance in these areas to verify that activities were consistent with applicable regulatory requirements.

b. Observations and Findings

QA 1 Replacement Parts

The inspectors reviewed 11 procurement engineering packages for QA 1 replacement parts for which 10 CFR Part 21 requirements were applicable. Receipt inspection acceptance criteria were appropriately identified and special receipt inspection requirements, when required, were clearly delineated. The procurement data sheets demonstrated that for each of the replacement items procured, an adequate technical evaluation had been performed with one exception involving differential pressure switches.

Contract P-97N3D-220220-000 was issued on September 11, 1997, for differential pressure switches with a range of 2 to 11 inch water column (WC) ; approximate dead band of .25 inch minimum/ .65 inch maximum, and a differential between set points (adjustable) of 2.2 inch WC. A post-receiving report, dated September 19, 1997, showed that four pressure switches procured on this contract were received under TVA item identification code (TIIC) BWY642B. The vendor, Nutherm International Inc., also transmitted nonconformance report (NCR) 3813 which documented a deficiency where the setpoint differential was not within tolerance. The vendor recommended a " use-as-is" disposition with the customer to evaluate the nonconformance for acceptability. The procurement engineering group (PEG) reviewed the vendor NCR and documented the disposition on PEG package 97-72998. The PEG concluded that the items were acceptable for stock with a special tag to indicate that an evaluation of the vendor NCR was required for each identified end use. The PEG provided the following note to Nuclear Stores for disposition of the vendor NCR:

> "The three remaining switches on 220220 shall be special tagged as follows; QA 1, PEG evaluation required for vendor NCR 3813 (See 9700072998)."

The inspectors determined that one pressure switch was received on September 12, 1997, under freight bill SADQ-20384, and three pressure switches were received on September 16, 1997, under freight bill FEDX-202287-450. The inspectors visited the warehouse on February 3, 1999, and verified that two of the pressure switches procured on TIIC BWY642B were still being held in stock. There were no special tags on either of the two pressure switches.

The inspectors discussed this inspection finding with TVA management and PER 99-001842 was written to document this deficiency. The licensee subsequently verified that two of the pressure switches were in inventory and two had been installed. The inspectors reviewed an engineering evaluation, dated September 12, 1997, that had been performed for use of one of the pressure switches as a replacement for instrument 1-FS-030-088A/B-B. The inspectors determined that the results of the evaluation were satisfactory. In response to the inspection finding, TVA performed an engineering

evaluation on February 4, 1999, for use of the other pressure switch as a replacement for instrument 2-FS-30-0067. Based on review of this evaluation, the inspectors determined that this pressure switch was used in a non-safety related application and that the only limited QA that applied was seismic 1L. The inspectors determined that the results of this evaluation were satisfactory.

In discussions with TVA management, the inspectors were informed that an extent of condition review for identification of other retag problems had been completed. A total of 100 retag packages were reviewed and no similar failures were found. Additionally, the two pressure switches in the warehouse was retagged in accordance with the instructions from the PEG.

10 CFR Part 50, Appendix B, Criterion V, requires activities affecting quality be prescribed by documented instructions, or procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions. Procedure SPP-4.2, Material Receipt and Inspection, Revision 1, Appendix C, Section 2.c, requires special tagging instructions specified by the PEG to be included in the identification of certain items. Failure to provide special tagging instructions for the differential pressure switches is identified as one example of NCV 50-390/99-01-01, Failure to Follow Procedure for Procurement of Replacement Parts. A second example of NCV 50-390/99-01-01 is documented in Section E2.2. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as PER 99-001842.

Approved Suppliers List

In the sample of QA 1 and QA 2 (commercial grade dedication) parts selected, the inspectors verified that the replacement part vendors were qualified to supply the 10 CFR Part 50, Appendix B, quality parts or support the certificate of compliance/conformance provided to document the quality of commercial grade procurement. The ASL vendors' qualification were supported by audits at the appropriate three year frequency performed by the industry nuclear procurement issues committee or the licensee. Vendor restrictions were appropriately identified and the restrictions were included in procurement documents and receipt inspection criteria.

Acceptable Substitutes

The inspectors reviewed 30 equivalency evaluations which determined if replacements for obsolete parts were acceptable as like-for-like substitutes. The technical evaluations for those items reviewed by the inspectors adequately addressed the differences between the original and replacement part. For those items which received equivalency evaluations, the acceptability of the replacement part was adequately verified.

However, during this review, the inspector identified a problem with a procurement action for which an equivalency evaluation was not performed.

Nuclear Store Requisition 1064562, dated November 11, 1996, was written to have spring charging motors, Part Q105C9393P2, returned to General Electric (GE) for refurbishment. TVA was informed, however, that the motors were obsolete and GE recommended the use of new spring charging motors, Part Q0184B7360G002. On June 2, 1997, an award was given to GE via Requisition 9700042347 for three spring charging motors under TIIC BXL-553P.

The 125 Vdc spring charging motors are used for the 6900 volt class 1E switchgear magna-blast circuit breakers. The inspectors inquired as to whether or not TVA considered this a like-for-like replacement or was an equivalency evaluation performed to assess the operating requirements for the motors concerning the inrush current demand on the 125 Vdc station battery. Procedure NEDP-8, Technical Evaluation for Procurement of Materials and Services, Revision 1, Section 3.3.2.D, requires a replacement item equivalency evaluation to be performed when differences are identified between the original item and the replacement item. Replacement item equivalency evaluations which affect manufacturer's approved drawings, TVA drawings, or other design output documents are required to be performed in accordance with the design control process.

The inspectors reviewed the following documents in order to verify the value of spring charging motor current used in the 125 Vdc battery sizing calculation:

- Calculation WBN-EEB-MS-TI11-0003, 125 VDC Vital Battery and Charger Capacity Evaluation, Revision 48, Table 1: 480/6900V Switchgear Internal Component Data.

- Vendor Technical Manual WBN-EEB-MS-TI11-0003, Attachment Table B-4, Operating Currents of Stored Energy Operated Circuit Breakers.

The review revealed that the design basis calculation used a value of 20 amperes (A) for the spring charging motor current. Since the PEG had not performed an equivalency evaluation, TVA was unable to present objective evidence which demonstrated that the new spring charging motor load current was identical to the replaced motor and that a revision to the calculation of record was not required. As discussed below, the new charging motor was evaluated as acceptable; however, a design problem was identified during a subsequent load current comparison between the two motors.

As part of the effort to verify load current compatibility, TVA requested and was provided, on February 4, 1999, information from GE which showed that the inrush currents for the original and replacement spring charging motors were 68 A and 66 A (+/- 10%) respectively. However, the inspectors identified that the licensee's calculation used the

motor's steady state current and not the motor inrush current as provided for in Institute of Electrical and Electronic Engineers (IEEE)-485-1978, IEEE Recommended Practice for Sizing Large Storage Batteries for Generating Stations and Substations. On February 12, 1999, TVA wrote PER 99-002180 to document the deficiency in Calculation WBN-EEB-MS-TI11-0003 which failed to use the recommended practice of IEEE-485 concerning the spring charging motors momentary loads for sizing the battery. The licensee also performed an engineering evaluation to assess the effects of not including the spring charging motors inrush current in the design basis calculation. The inspectors reviewed the engineering evaluation and conducted discussions with TVA engineering personnel. Based on the review and discussions, the inspectors concurred with the analysis conclusion that the battery was adequately sized and had ample margin for energizing the spring charging motors. Thus, both the original and replacement motor were satisfactory for use in this application.

10 CFR Part 50, Appendix B, Criterion III, requires applicable design inputs to be correctly translated into specifications, drawings, procedures or instructions. Applicable design inputs, such as design bases, regulatory requirements, codes and standards shall be identified, documented, and their selection reviewed and approved. Watts Bar committed to using IEEE-485, as documented in UFSAR, Section 8.1.5.3. The licensee's failure to correctly incorporate the design input of the spring charging motor inrush current in Calculation WBN-EEB-MS-TI11-0003, as delineated in IEEE-485 is identified as NCV 50-390/99-01-02, Failure to Use Spring Charging Motor Inrush Current in Battery Sizing Calculation. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as PER 99-002180.

Receipt Inspection Criteria and Resolution of Receipt Inspection Deficiencies

The inspectors reviewed approximately 50 receipt inspection documentation packages for both QA 1 and QA 2 replacement parts. Appropriate acceptance criteria were specified and verified for the replacement items reviewed. With one noted exception, resolution of receipt inspection deficiencies was effective. The exception was related to a deficient extent of condition review regarding Copes-Vulcan valve cylinder/plug assemblies. The three assemblies were received in two separate shipments in 1996 under the same purchase contract. The licensee identified a change of material on the second shipment and placed the item on QA hold. The previous shipment of two assemblies had been accepted and placed in the warehouse for issue. Procurement engineering evaluated the deficiency as documented in Receipt QC Rejection Report WBN-TVA-R951953, dated December 4, 1998, and established special tagging requirements. The evaluation did not review the contract to identify all items to which the special tagging requirements applied and the two warehouse assemblies were not tagged. There were no installations of these parts in the plant. Following identification, the licensee placed the warehouse parts on QA hold and initiated PER 99-001883, dated February 4, 1999, to address this issue.

Self-Assessment

There were three self-assessment audits of the replacement parts procurement process in the previous two years. These included assessment of PEG and acquisition and inventory management activities. Audit findings were adequately addressed. The scope of the audits was generally adequate and focused on item disposition, storage, and ability to support the plant maintenance schedule. A good audit element was the review of the effectiveness of previous audit findings included in the audit scope. However, the inspectors noted that review of receipt inspectors' performance was not directly addressed although there were several PERs written in the previous two years that indicated a lack of attention to detail by the receivers.

c. Conclusions

One example of failure to follow procurement procedures was identified as an NCV in that the licencee failed to tag parts for identification of special test or evaluation prior to issue. Adequate technical evaluations were performed to verify the acceptability of substitution of obsolete parts. Also, an NCV for inadequate design control was identified for failure to assess the design bases impact of a change in equipment design performance. Appropriate acceptance criteria were specified and verified for receipt of safety related replacement parts. Resolution of receipt inspection discrepancies was effective, although one example was identified in which the extent of condition review was deficient. Self-assessment of the procurement process was adequate.

E2.2 Commercial Graded Dedication Procurement

a. Inspection Scope (38703)

The inspectors reviewed a sample of 40 commercial grade dedications to verify that appropriate actions had been implemented to upgrade the parts for use in safety related applications.

b. Observations and Findings

In general, commercial grade dedication activities were appropriate. Technical evaluations for commercial grade dedications identified appropriate component critical characteristics and documented these as acceptance criteria. With one exception, post installation testing, when required to dedicate replacement parts, was appropriately designated and verified. The exception was related to a compressor installed in main control room chiller B, for which the dedication package required post installation functional performance testing as specified in several referenced maintenance procedures. The PEG package, 9300023710, dated July 21, 1998, specified that Maintenance Procedures MI-31.03, 1000-Hour Maintenance Procedure for Dunham-Bush Package Chiller Units, MI-31.04, Periodic Maintenance Procedure for Dunham-Bush Package Chiller Units, and MI-31.06, 75,000 Hour Dunham-Bush Package Chiller Inspection, should be performed. The WO for the compressor installation, WO 98-001482-002, was closed on June 10, 1998, and the chiller returned to operable without the completion of the functional test requirement sheet which would have verified performance of the post installation testing. This WO documented the performance of Maintenance Procedure MI 31.6, but made no reference to the other procedures referenced in the dedication package for post installation testing. The functional test requirement sheet specified that the post installation verification was to be performed by the cognizant engineer. The licensee initiated PER 99-001868, dated February 3, 1999, to address this issue. Following identification of this issue, the system engineer reviewed the work documentation and determined that adequate functional testing was performed. Maintenance procedure SSP-6.02 Maintenance Management System,

Revision 16, required Maintenance to assure that test requirements as specified in dedication requirement sheets have been completed. This item is identified as a second example of NCV 50-390/99-01-01, Failure to Follow Procedure for Procurement of Replacement Parts. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as PER 99-001868.

c. Conclusions

The program implementation for commercial grade dedication was adequate. Technical evaluations for commercial grade dedications identified appropriate component critical characteristics and documented these as acceptance criteria. A second example of an NCV for failure to follow procurement procedures was identified for a deficiency in verifying performance of a post installation test required by a dedication package.

E8 Miscellaneous Engineering Issues (92903, 92700)

E8.1 (Closed) Inspection Followup Item (IFI) 50-390/97-07-04: Review of Spent Fuel Pool (SFP) Drag Testing Requirements

This item addressed an apparent inconsistency between the licensee's commitment and practice for monitoring SFP rack fuel cell configuration. The commitment documented in the Safety Evaluation Report, SFP Storage Capacity Increase- Amendment No. 6, dated July 28, 1997, stated that drag testing of fuel assemblies would be performed during each refueling outage. This report indicated that drag testing would be performed on each assembly during each outage. The practice at Watts Bar was to monitor drag in fuel assemblies during insertion and withdrawal, resulting in approximately 275 fuel assemblies being monitored each outage.

The licensee submitted a letter to the NRC on November 13, 1998, Watts Bar Unit 1 SFP Storage Capacity Increase - Amendment No. 6 - Drag Testing Requirement (TAC No. M96930) to resolve this issue. The letter requested a revision of the Safety Evaluation Report to clarify the licensee's methodology for monitoring SFP fuel assembly configuration. NRC letter to TVA, dated February 9, 1999, Watts Bar Nuclear Plant -Correction Regarding Spent Fuel Pool Storage Racks, agreed and stated that Watts Bar was to monitor insertion and withdrawal of fuel assemblies at each outage and not to require that drag tests be performed beyond the initial tests.

E8.2 (Closed) Unresolved Item (URI) 50-390/98-10-02: Evaluation of Ice Basket Heavy Weight Analysis.

This item involved inconsistent guidance regarding the ice basket heavy weight limits implemented via licensee Procedure 1-SI-61-2, 18 Month Ice Weighing, Revision 4. The licensee obtained additional guidance from the vendor (Westinghouse) regarding

the design basis for heavy weights. This guidance was contained in Letter WAT-D-10600, dated January 26, 1999. The letter stated that the design basis for the maximum individual basket weight is 1795 lbs and 1776 lbs for the maximum average weight of the ice baskets in any three-by-three frame array of baskets. This weight includes the basket weight, which has been shown to be approximately 250 lbs, plus the ice weight. The licensee's procedure required an array analysis only if ice weight of any basket exceeded 1545 lbs (1795 total) which was not conservative. The maximum individual ice basket weight was not defined in the procedure. Licensee analysis of the previous outage data showed that approximately 100 baskets exceeded the individual maximum and five array analyses exceeded the maximum allowance. The Westinghouse letter provided justification for continued operation, which was considered by the inspector to be a reasonable judgment. The licensee implemented appropriate corrective actions which the inspector verified. These included: correction of the procedural guidance, implementation of more specific guidance for array analysis, confirmation of the empty basket weight, and clarification of the UFSAR. 10 CFR Part 50, Appendix B, Criterion V, requires activities affecting quality to be prescribed by documented instructions and to be accomplished in accordance with these instructions. This failure to adequately prescribe heavy ice weight limits in a procedure is identified as NCV 50-390/99-01-03: Inadequate Procedure for Evaluation of Heavy Weight Ice Baskets. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as PER 98-016318.

E8.3 (Open) Licensee Event Report (LER) 50-390/1999001: Both Trains of Electric Board Room Chillers Out of Service. This problem was previously described in NRC Inspection Report 50-390/98-11, Section M2.1. The inspector reviewed the LER with licensee personnel and discussed the electric board room (EBR) ventilation system status with a system engineering manager to confirm whether the Maintenance Rule was being adequately considered. The system had been classified as "a(1)" due to previous failures. The recent failure involving loss of refrigerant had been appropriately considered as a maintenance-preventable functional failure, and the licensee was establishing monitoring criteria as required by the rule. The licensee's evaluation of the problems was thorough, and the licensee demonstrated a good understanding of Maintenance Rule requirements. The licensee indicated that, due to the current and previous problems, a long-term action plan was also under development including possible design changes. This item remains open pending licensee development of monitoring criteria and a long-term action plan for EBR chillers.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 General Observations (71750)

The inspectors routinely observed radiologically controlled areas to verify adequacy of access controls, locked areas, personnel monitoring, surveys, and postings. The inspectors also routinely reviewed chemistry results including weekly reactor coolant system (RCS) tritium.

Radiological controls were adequate. Personnel were attentive and followed requirements. The licensee provided good management oversight of chemistry results and regulatory limits were being met.

R1.2 Inspection of Fuel Handling Equipment (71750)

The inspector observed MI-79.001, Fuel Handling Equipment Periodic Inspection, Revision 5, including the pre-job brief and entry into the fuel transfer canal for inspection and periodic maintenance on the conveyer cart and track, transfer tube gate valve, and upender. The pre-job brief covered the work procedures, expected radiation and contamination levels, and detailed radiological precautions. Radiological precautions included dress-out, portable air-powered respirators, and remote readout personnel dosimetry. Personnel involved were knowledgeable of radiological control requirements. Radiological precautions were strictly adhered to during the work. A crane operator was standing by and a man basket was staged for personnel safety.

Radiological controls were well planned and strictly adhered to during entry into the fuel transfer canal for equipment inspection and periodic maintenance. Extra personnel and equipment were staged for personnel safety.

R1.3 Radioactive Effluent Monitoring Instrumentation

a. Inspection Scope (84750)

The inspector reviewed licensee's procedures and records pertaining to surveillances for selected radioactive effluent monitors. The surveillance procedures and records were evaluated for consistency with the operational and surveillance requirements for demonstrating the operability of the monitors. The requirements were specified in Sections 1/2.1.1 and 1/2.1.2 of the Offsite Dose Calculation Manual (ODCM).

The inspector toured the control room and relevant areas of the plant with a licensee representative to determine the operational status for the following effluent monitors.

0-RE-90-122	Liquid Radwaste Effluent Line
0-RE-90-225	Condensate Demineralizer Regenerate Line
1-RE-90-400A	Shield Building Exhaust Noble Gas Activity Monitor
1-RE-90-130	Containment Purge Noble Gas Activity Monitor

b. Observations and Findings

The effluent monitors were found to be well maintained and operable at the time of the tours.

The inspector reviewed 14 procedures related to channel checks, source checks, channel calibrations, and channel operational tests for the effluent monitors. The inspector determined that the procedures included provisions for performing the required surveillances in accordance with the relevant sections of the ODCM and at the specified frequencies. The inspector also reviewed recently completed surveillances for the

above listed monitors. The records indicated that the surveillances were being kept current and performed in accordance with their applicable procedures. Data compiled by the licensee from operations logs indicated that the overall availability of effluent monitors year-to-date during fiscal year 1999 was greater than 95 percent.
The inspector also observed segments of the calibration of the Unit 2 shield building exhaust radiation monitor 2-RE-90-400. Problems were encountered during the calibration sequences for switching the monitor from the normal low level range to the mid and high level ranges and with the sample flow rate for those ranges. The inspector noted that, when problems were encountered, the licensee would suspend the calibration and consult with the vendor for trouble-shooting guidance to correct the problems. The licensee was following the calibration procedure but some steps had to be repeated, after trouble-shooting, in order to realign the monitor into the proper mode for the subsequent steps in the calibration procedure. The licensee was also documenting the problems encountered, and their solutions, for use in revising the calibration procedures (1 & 2-ODI-90-57) before their next use. The inspector determined that the licensee was taking appropriate measures to ensure that the monitor was properly calibrated and to mitigate problems during subsequent calibrations.

c. Conclusions

The licensee had implemented an effective program for maintaining radioactive effluent monitoring instrumentation in an operable condition and for performing the required surveillances to demonstrate their operability.

R1.4 Meteorological Monitoring Program

a. Inspection Scope (84750)

The inspector reviewed the licensee's procedures and records for the surveillances performed to demonstrate operability of the meteorological monitoring instrumentation as specified in Section 1/2.1.3 of the ODCM.

b. Observations and Findings

The inspector reviewed meteorological surveillance procedures and determined that they included provisions for performing daily channel checks and semiannual channel calibrations. The inspector also reviewed the licensee’s records for calibration of the instrumentation used to monitor wind speed, wind direction, and air temperature at 10, 46, and 91 meters above ground level. Those records indicated that the instrument calibrations were current and had been performed in accordance with the applicable procedures. The inspector reviewed recently completed control room surveillance logs and determined that channel checks of the meteorological monitoring instruments had been performed on a daily basis. During a tour of the control room the inspector noted that the meteorological monitoring instrumentation was then currently operable. Section

2.3.3.2 of the UFSAR, which described the operational phase of the meteorological monitoring program, indicated that the basic objective was to maintain data collection performance to assure at least 90 percent joint recoverability and availability of data needed for assessing concentrations and doses resulting from accidental or routine releases. Licensee records for meteorological data collection performance indicated that the data recoverability during the second quarter of 1998 was slightly below the 90 percent goal and greater than 98 percent during the fourth quarter.

c. Conclusions

The surveillance requirements for demonstrating operability of the meteorological monitoring instrumentation were met and the performance with respect to collection of meteorological data improved during the fourth quarter of 1998.

R1.5 Control Room Emergency Ventilation System

a. Inspection Scope (84750)

The inspector reviewed the licensee's procedures and records for the surveillances required to demonstrate operability of the control room emergency ventilation system (CREVS). The procedures and records were evaluated for consistency with the operational and surveillance requirements delineated in TS Sections 3.7.10 and 5.7.2.14.

The inspector toured the mechanical equipment room in which the control room ventilation systems were located. The licensee's cognizant system engineer accompanied the inspector on the tour, during which the major components of the systems were located and identified. The emergency ventilation systems included two independent trains consisting of fans, dampers, high efficiency particulate air filters, and charcoal adsorber filter beds.

b. Observations and Findings

The inspector verified that the air flow paths and arrangement of the system components within those paths were consistent with the system diagram, (Figure 9.4-1), referenced in Section 9.4.1.2 of the UFSAR. The inspector observed that the components and associated duct work were well maintained structurally and that there was no physical deterioration of the equipment or duct work sealants and flexible joints.

The inspector reviewed selected ventilation system surveillance procedures and determined that they included provisions for performing functional tests, filter leak tests, air flow measurements, differential pressure measurements, and charcoal adsorption efficiency testing. The surveillance frequency and acceptance criteria for the test results specified in the procedures were consistent with the TS requirements. Review

of selected test records, generally the most recently completed, indicated that they had been performed in accordance with the testing procedures and that the acceptance criteria had been met.

c. Conclusions

The material condition of the CREVS was well maintained and the surveillances for demonstrating operability of the systems were being performed as required.

S1 Conduct of Security and Safeguards Activities

S1.1 General Observations (71750)

The inspectors routinely observed security activities for conformance to requirements which included protected area barriers, isolation zones, personnel access, and package inspections.

Security personnel performed acceptably and barriers and zones were well maintained.

V. Management Meetings

X1 Exit Meeting Summary

The resident inspectors presented inspection findings and results to licensee management on February 26, 1999. Interim exits were conducted on January 29, February 5, and February 23, 1999. The licensee acknowledged the findings presented.

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

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Beecken, Maintenance and Modifications Manager
J. Cox, Training
L. Hartley, Maintenance Rule Coordinator
P. Hughes, Radiological Control Manager
S. Krupski, Site Scheduling Manager
D. Kulisek, Operations Manager
W. Lagergren, Plant Manager
J. Maddox, Engineering Manager
D. Nelson, Business and Work Performance Manager
R. Wiggal, System Engineering Manager

NRC

P. Van Doorn, Senior Resident Inspector
D. Rich, Resident Inspector
T. Morrissey, Project Engineer
R. Gibbs, Maintenance Inspector
D. Jones, Reactor Engineer

R. Moore, Reactor Engineer
C. Smith, Reactor Engineer

INSPECTION PROCEDURES USED

IP 37550:	Engineering
IP 37551:	Onsite Engineering
IP 38703:	Commercial Grade Dedication
IP 40500:	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 61726:	Surveillance Observations
IP 62706:	Maintenance Rule
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 84750:	Radioactive Waste Treatment, and Effluent and Environmental Monitoring
IP 92700:	On-site LER Followup
IP 92903:	Followup - Engineering

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-390/99-01-01	NCV	Failure to Follow Procedure for Procurement of Replacement Parts (Sections E2.1 and E2.2).
50-390/99-01-02	NCV	Failure to Use Spring Charging Motor Inrush Current in Battery Calculation (Section E2.1).
50-390/99-01-03	NCV	Inadequate Procedure for Evaluation of Heavy Weight Ice Baskets (Section E8.2).

Closed

50-390/98-05-01	VIO	Failure to Include all SSCs Within the Scope of the Maintenance Rule (Section M8.1).
50-390/98-05-03	VIO	Failure to Adequately Monitor SSCs Under the Maintenance Rule (Section M8.2).
50-390/99-01-01	NCV	Failure to Follow Procedure for Procurement of Replacement Parts (Sections E2.1 and E2.2).
50-390/99-01-02	NCV	Failure to Use Spring Charging Motor Inrush Current in Battery Calculation (Section E2.1).

50-390/97-07-04	IFI	Review of Spent Fuel Pool (SFP) Drag Testing Requirements (Section E8.1).
50-390/98-10-02	URI	Evaluation of Ice Basket Heavy Weight Analysis (Section E8.2).
50-390/99-01-03	NCV	Inadequate Procedure for Evaluation of Heavy Weight Ice Baskets (Section E8.2).

Discussed

50-390/1999001	LER	Both Trains of Electric Board Room Chillers Out of Service (Section E8.3).