

May 10, 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. 50-390/99-02 AND
50-391/99-02

Dear Mr. Scalice:

This refers to the inspection conducted on February 28 through April 10, 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. Outage activities exhibited a strong emphasis on risk which was commendable.

Within the scope of the inspection, violations or deviations were not identified.

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

TVA

2

cc w/encl:
Senior Vice President
Nuclear Operations
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Jack A. Bailey, Vice President
Engineering and Technical Services
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Richard T. Purcell
Site Vice President
Watts Bar Nuclear Plant
Tennessee Valley Authority
P. O. Box 2000
Spring City, TN 37381

General Counsel
Tennessee Valley Authority
ET 10H
400 West Summit Hill Drive
Knoxville, TN 37902

N. C. Kazanas, General Manager
Nuclear Assurance
Tennessee Valley Authority
5M Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mark J. Burzynski, Manager
Nuclear Licensing
Tennessee Valley Authority
4X Blue Ridge
1101 Market Street
Chattanooga, TN 37402-2801

cc w/encl continued: See page 3

TVA

3

cc w/encl: Continued
Paul L. Pace, Manager
Licensing
Watts Bar Nuclear Plant
Tennessee Valley Authority
P. O. Box 2000
Spring City, TN 37381

William R. Lagergren, Plant Manager
Watts Bar Nuclear Plant
Tennessee Valley Authority
P. O. Box 2000
Spring City, TN 37381

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

County Executive
Meigs County Courthouse
Decatur, TN 37322

Michael H. Mobley, Director
Division of Radiological Health
TN Dept. of Environment and
Conservation
3rd Floor, LNC Annex
401 Church Street
Nashville, TN 37243-1532

May 10, 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. 50-390/99-02 AND
50-391/99-02

Dear Mr. Scalice:

This refers to the inspection conducted on February 28 through April 10, 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. Outage activities exhibited a strong emphasis on risk which was commendable.

Within the scope of the inspection, violations or deviations were not identified.

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

TVA

3

cc w/encl:
Senior Vice President
Nuclear Operations
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Jack A. Bailey, Vice President
Engineering and Technical Services
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Richard T. Purcell
Site Vice President
Watts Bar Nuclear Plant
Tennessee Valley Authority
P. O. Box 2000
Spring City, TN 37381

General Counsel
Tennessee Valley Authority
ET 10H
400 West Summit Hill Drive
Knoxville, TN 37902

N. C. Kazanas, General Manager
Nuclear Assurance
Tennessee Valley Authority
5M Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mark J. Burzynski, Manager
Nuclear Licensing
Tennessee Valley Authority
4X Blue Ridge
1101 Market Street
Chattanooga, TN 37402-2801

cc w/encl continued: See page 3

TVA

4

cc w/encl: Continued
Paul L. Pace, Manager
Licensing
Watts Bar Nuclear Plant
Tennessee Valley Authority
P. O. Box 2000
Spring City, TN 37381

William R. Lagergren, Plant Manager
Watts Bar Nuclear Plant
Tennessee Valley Authority
P. O. Box 2000
Spring City, TN 37381

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

County Executive
Meigs County Courthouse
Decatur, TN 37322

Michael H. Mobley, Director
Division of Radiological Health
TN Dept. of Environment and
Conservation
3rd Floor, LNC Annex
401 Church Street
Nashville, TN 37243-1532

Distribution w/encl:

L. R. Plisco, RII
A. P. Hodgdon, OGC
B. J. Keeling, GPA/CA
M. D. Tschiltz, OEDO
H. N. Berkow, NRR
R. E. Martin, NRR
C. F. Smith, RII
D. W. Jones, RII
D. H. Thompson, RII
L. S. Mellen, RII
PUBLIC

Distribution w/encl continued: See page 4

TVA

5

Distribution w/encl: Continued
NRC Resident Inspector
U.S. Nuclear Regulatory Commission
1260 Nuclear Plant Road
Spring City, TN 37381

OFFICE	RII:DRP	RII:DRP	RII:DRP	RII:DRS	RII:DRS		
SIGNATURE							
NAME	T Morrissey alt	P VanDoorn	D Rich 05/06/99	J Coley 05/06/99	D Jones 05/06/99		
DATE	7/ /25	7/ /25	7/ /25	7/ /25	7/ /25	7/ /25	7/ /25
COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY

DOCUMENT NAME: G:\WB\REPORTS\IR99-02.WPD

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

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

Report No: 50-390/99-02, 50-391/99-02

Licensee: Tennessee Valley Authority

Facility: Watts Bar, Units 1 and 2

Location: 1260 Nuclear Plant Road
Spring City TN 37381

Dates: February 28 through April 10, 1999

Inspectors: P. Van Doorn, Senior Resident Inspector
D. Rich, Resident Inspector
D. Jones, Senior Radiation Specialist (Sections R1.2 and R1.3)
J. Coley, Reactor Inspector (Section M1.4)
T. Morrissey, Project Engineer (Sections O1.2, M1.1, M1.2, and M2.1)

Approved by: P. E. Fredrickson, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Enclosure

EXECUTIVE SUMMARY

Watts Bar, Units 1 and 2 NRC Inspection Report 50-390/99-02, 50-391/99-02

This integrated inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a six-week period of resident inspection, a regional in-service inspection program inspection, and a regional radiological controls inspection.

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).
- Operations during reactor coolant system (RCS) draindown operations and RCS midloop and vacuum fill operations were well controlled and well planned. Briefings were thorough and focused on safety. Senior management oversight during RCS drain and vacuum fill operations was regarded as a strength. Midloop operations were conducted safely and the time spent in midloop was minimized (Section O1.2).
- An engineered safety feature system walkdown of the safety injection system was conducted. No substantive concerns were identified as a result of this walkdown and system lineup, material condition, and housekeeping were acceptable (Section O2.1).
- The licensee has continued to implement a thorough and self-critical approach to problems. A low threshold for initiation of problem evaluation reports (PERs) was demonstrated. Corrective action plans were typically thorough. Occasional problems were noted by the Management Review Committee (MRC) and corrected. Some increase in the MRC rejection rate for corrective action plans was appropriately recognized and highlighted by licensee management. Prioritization of PERs for mode changes was appropriately conservative. A good initiative was noted, in that, a weekly corrective action analysis was provided to managers during the outage period to highlight areas needing attention. Thorough Nuclear Assurance oversight of operational activities was noted (Section O7.1).

Maintenance

- Twenty maintenance and surveillance activities were adequately performed. Maintenance personnel were knowledgeable and carefully followed procedures to resolve plant equipment and component problems. Work performed was typically well-documented (Section M1.1).
- Outage activities were generally well-controlled, with good management oversight and emphasis on risk management. Refueling operations were conducted carefully including handling of lead test assemblies and inspection of fuel assembly inlet nozzles

during offload. Outage activities in containment were well-controlled, and the inspectors found the containment closeout to be adequate (Section M1.2).

- Licensee management was focused on risk assessment and risk reduction through planning and frequent review. The Outage Risk Assessment and Management program was an effective tool for the licensee and was utilized extensively to minimize risk and avoid compromising protected train safety and support equipment (Section M1.3).
- Inservice examination activities were performed using approved procedures by certified examiners who were skillful in the use of the test equipment, knowledgeable of the test methods, and who properly recorded and evaluated inspection results in accordance with the appropriate test procedures. Documentation reviewed was complete and evaluations/acceptance of examination results were conducted in accordance with the applicable procedures, technical specifications and industry standards. Engineering demonstrated a noteworthy persistence in solving problems and performing valid examinations (Section M1.4).
- The maintenance activities on the turbine-driven auxiliary feedwater pump were adequately performed and well documented. Review of Maintenance Instruction-1.003, Disassembly, Inspection, and Reassembly of Auxiliary Feedwater Pump Turbine, and discussions with the licensee revealed that the as-found clearance between the inconel governor stem and the carbon spacers was within the required tolerance and no indications of stem binding were found. The post-maintenance test run was observed by the inspectors and was satisfactory (Section M2.1).

Engineering

- Timely and thorough support was noted in the areas reviewed, which included emergent issues and other activities such as MRC and Plant Operations Review Committee meetings. A safety evaluation was thorough and technically adequate (Section E1.1).

Plant Support

- Radiological controls were adequate. Personnel were attentive and followed requirements. The outage activities observed were performed well with good emphasis on as low as reasonably achievable (ALARA) and contamination control. Briefings were adequate and technicians showed good awareness of conditions (Section R1.1).
- The licensee followed established procedures for evaluating radiation exposure to workers installing lead shielding on the Unit 1 lower containment pressurizer surge line. Radiological controls for work activities associated with the lower pressurizer surge line were in accordance with facility procedures and preliminary exposure results for involved workers were within regulatory limits. The post-shield survey showed expected values relative to earlier documented dose rates (Section R1.2).

- The licensee properly monitored and controlled personnel radiation exposure during the Unit 1 Cycle 2 refueling outage and posted area radiological conditions in accordance with 10 CFR Part 20. Personnel entering the radiologically controlled area were adequately briefed on radiological hazards and protective measures. Maximum individual radiation exposures were controlled to levels which were well within the regulatory limits for occupational dose specified in 10 CFR 20.1201(a). The licensee was successful in meeting established ALARA goals, except for fiscal year 1996. The annual collective dose of 3.0 man-rem for calendar year 1998 was a record low for domestic commercial power reactors (Section R1.3).
- The licensee closely monitored primary coolant chemistry during the shutdown for the Unit 1 Cycle 2 refueling outage. The shutdown chemistry control plan was effective in radiation-field reduction by removing radioactive materials from the internal surfaces of the reactor coolant system components; however, the target activity level for clean-up of the coolant was not achieved (Section R1.3).
- Security personnel performed acceptably and special precautions for handling of tritium assemblies were performed in accordance with procedures (Section S1.1).

Report Details

Summary of Plant Status

Unit 1 began this inspection period operating in Mode 1 at 11 percent reactor power and was shut down the same day in order to begin the Cycle 2 refueling outage. Refueling and outage activities continued throughout the inspection period. The unit was in Mode 3 making preparations for startup at the end of the inspection period.

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), crew and turnover observations; review of logs, standing and night orders, CR staffing, and tagouts; attendance at the outage turnover meetings; containment walkdowns; and observation of assistant unit operator (AUO) activities.

Operations during this period was dominated by refueling activities and reduced inventory operations for steam generator (SG) inspection activities. Operations support of refueling activities and reduced inventory/midloop is detailed in Section O1.2.

The conduct of operations was professional and safety-conscious. Requirements were met for CR conduct and other areas reviewed such as turnovers, tagouts, documentation, staffing, and AUO activities.

O1.2 Reactor Coolant System (RCS) Draindown and Reduced Inventory (71707)

a. Inspection Scope

The inspectors observed initial RCS draindown and operations in support of midloop/reduced inventory activities and vacuum refill of the RCS. The inspectors reviewed General Operating Instruction (GO)-7, Refueling Operations, Revision 6; GO-10, Reactor Coolant System Drain and Fill Operations, Revision 2; and Abnormal Operating Instruction (AOI)-14, Loss of RHR Shutdown Cooling, Revision 19.

b. Observations and Findings

The inspectors attended briefings and observed initial RCS draindown operations. Briefings focused on control of inventory and safety measures including lessons learned from other plants, particularly for nitrogen bubbling of the SGs, which was a first time

evolution for Watts Bar. Operations were conducted in accordance with procedures and were supervised by senior management.

The inspectors observed portions of simulator training for midloop operations, attended pre-evolution briefings for midloop and vacuum fill, and observed a significant part of these operations. Discussions with the operators demonstrated that they were knowledgeable of and had previous experience in midloop and vacuum fill operations. The inspectors verified operator knowledge of actions necessary upon the loss of the operating residual heat removal (RHR) pump. The simulator training and briefings covered the applicable procedures, precautions and limitations and emphasized safe performance. Senior management was present at the briefings and during the evolutions. Management stressed the need to perform the evolutions in a safe, controlled manner and not to feel schedule pressure. The evolutions were conducted in a controlled manner with strict water inventory control used to ensure that indicated levels were accurate. The licensee maintained more than the minimum number of RCS level indication systems in service; however, the ultra-sonic level monitoring system did not function, and the licensee was unable to benefit from its use during midloop operations. The licensee had a heightened sensitivity to the risk associated with midloop operations and minimized the time spent in these conditions. The RCS water level was increased above midloop levels after SG primary side restoration. This interim fill of the RCS reduced the time spent in midloop by approximately 22 hours.

c. Conclusions

Operations during RCS draindown operations and RCS midloop and vacuum fill operations were conservative and well-planned. Briefings were thorough and focused on safety. Senior management oversight during RCS drain and vacuum fill operations was regarded as a strength. Midloop operations were conducted safely, and the time spent in midloop was minimized.

O1.3 Measures to Prevent Inadvertent Loss of RCS Inventory in Hot Shutdown

a. Inspection Scope (71707)

The inspector reviewed Generic Letter (GL) 98-02, Loss of Reactor Coolant Inventory and Associated Potential for Loss of Emergency Mitigation Functions While In a Shutdown Condition, and verified administrative controls were implemented as described in the licensee's response to GL 98-02.

b. Observations and Findings

GL 98-02 requested licensees to address the susceptibility of their RHR and emergency core cooling systems (ECCS) to common-cause failure as a result of RCS draindown while in a hot shutdown condition. The licensee defined hot shutdown as Mode 4 and found that certain pathways existed for inadvertent RCS draindown and, although each path was controlled administratively, concluded that procedural enhancements should

be made which would require a hold order on valve 1-HCV-74-34 when the plant was in Mode 4. GO-6, Unit Shutdown from Hot Standby, Revision 11, was modified to add Step

5b to Section 5.3, which required a hold order to be placed on valve 1-HCV-74-34 during plant cooldown prior to entering Mode 4. The licensee found that this change to GO-6 was implemented after reaching cold shutdown. Thus, no hold order was in effect on valve 1-HCV-74-34 while in Mode 4 during cooldown. GO-10, Reactor Coolant System Drain and Fill Operations, Revision 3, Section 5.2.2, Note 5, explained that the hold order on valve 1-HCV-74-34 may be removed for operation but, as required by Step 24, the hold order will be replaced prior to exiting Section 5.2.2. Both GO-6 and GO-10 ensured that a hold order was in effect when the procedures were exited and since neither procedure was in effect during heatup, neither could ensure that a hold order remained in effect when the plant transitioned from Mode 5 to Mode 4. Therefore, after exiting GO-10, the hold order on valve 1-HCV-74-34 was cleared. GO-1, Unit Startup from Cold Shutdown, Revision 11, Section 5.3, Step 21, required the hold order on valve 1-HCV-74-34 to be removed during plant heatup just prior to entering Mode 3. However, there was no requirement in GO-1, which required a hold order to be on valve 1-HCV-74-34 while in Mode 4. The inspector found that, on April 8 and 9, a hold order was not in effect on valve 1-HCV-74-34 while the plant was in Mode 4 and operating under GO-1. Several procedural requirements to prevent inadvertent loss of RCS inventory while in hot shutdown were not adequate and several more were not adequately implemented.

The potential consequences of opening valve 1-HCV-74-34 while in Mode 4 include the transfer of hot RCS inventory to the refueling water storage tank and resultant common cause failure of both ECCS trains. However, the licensee maintained valve 1-HCV-74-34 locked shut and also, the licensee investigated maintenance and operations procedures which would have required operation of valve 1-HCV-74-34 in Mode 4 during the Cycle 2 refueling outage and found none. Therefore, the safety significance of the failure to maintain a hold order on valve 1-HCV-74-34 was small. This failure constitutes a violation of minor significance and is not subject to formal enforcement action. This problem is in the licensee's corrective action program as PER 99-04964.

c. Conclusions

A minor violation was identified because several procedural requirements to prevent inadvertent loss of RCS inventory while in hot shutdown were not adequate and several more were not adequately implemented. A procedure change to GO-6 was implemented late, after the plant had passed through Mode 4 and was cooled down. A procedure change to GO-1 did not adequately state relevant requirements.

O2 Operational Status of Facilities and Equipment

O2.1 Engineering Safety Feature System Walkdown (71707)

The inspectors walked down portions of the safety injection system. System lineup, material condition, and housekeeping were acceptable in all cases. No substantive concerns were identified as a result of this walkdown.

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 PERs for adequacy of corrective actions and implementation of procedural requirements;
- Observation of one Plant Operations Review Committee (PORC) meeting;
- Observation of Nuclear Assurance (NA) personnel oversight;
- Review of PER initiations; and
- Review of PER prioritization.

The licensee has continued to implement a thorough and self-critical approach to problems. A low threshold for initiation of PERs was demonstrated. Corrective action plans were typically thorough. Occasional problems were noted by the MRC and corrected. Some increase in the MRC rejection rate for corrective action plans was appropriately recognized and highlighted by licensee management. Prioritization of PERs for mode changes was appropriately conservative. A good initiative was noted, in that, a weekly corrective action analysis was provided to managers during the outage period to highlight areas needing attention. Thorough NA oversight of operational activities was noted.

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) and surveillance instructions (SIs) and reviewed associated documentation:

- WO 98-008681-000, Limitorque Operator 1-MVOP-063-0048 Maintenance M1380V

- 0-SI-82-3, 18-Month Loss of Offsite Power -DG 1A-A, Revision 8
- 0-SI-82-5, 18-Month Loss of Offsite Power - DG 2A-A, Revision 6
- 1-SI-63-917, Non-Intrusive Testing of Cold Leg Accumulator Check Valves, Revision 0
- 1-SI-63-907, Residual Heat Removal Hot Leg and Cold Leg Injection Check Valve Testing During Refueling Outage, Revision 6
- WO 98-002396-000, Replace #4 RCP #1 Seal and Cartridge Seal
- PMTI M39767A-1, Post-Maintenance Test DG 1A-A, Revision 1
- 1-SI-68-11, 18-Month Channel Calibration Pressurizer Level Channel III Loop 1-LPL-68-320 (L-461), Revision 2
- WO 98-014660-000, Inspection of Switchgear Bus and MCC 1-MCC-214-001 IAW MI-57.201
- WO 99-000843-000, Inspection of GE ET 16 Indicating Lights and Light Resistors, 1A-A 6.9-kV Shutdown Board
- WO 98-009150-000, Inspection, Lubrication And Testing of Aux FW Pump Turbine 1A-S 1861V, and MI-1.003, Disassembly, Inspection, and Reassembly of Auxiliary Feedwater Pump Turbine-Governor Reassembly, Revision 6
- WO 97-017114-000, Replace the Rotating Element in CCP 1A-A
- MI-82.003, 18-Month Diesel Generator Engine Inspection, 1B-B D/G, Revision 18
- PMTI-M39767A-2, Governor Upgrade & Voltage Regulator Replacement-DG 1B-B, Revision 1
- 0-SI-82-6, 18-Month Loss of Offsite Power DG 2B-B, Revision 6
- 0-SI-82-4, 18-Month Loss of Offsite Power With Safety Injection DG 1B-B, Revision 6
- 1-SI-72-906-B, Containment Spray System Valve Position Indication Verification and Full Stroke Exercising (Train B), Revision 3
- 1-SI-3-904, Main Feedwater System Valve Full Stroke Exercising During Cold Shutdown, Revision 6

- 1-SI-62-907, Chemical Volume Control System Valve Position Indication Verification and Full Stroke Exercising, Revision 5
- WO 99-000742-000, Attachment 2, Turbine Driven Auxiliary Feedwater Pump Control Response Verification

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

Twenty maintenance and surveillance activities were adequately performed. Maintenance personnel were knowledgeable and carefully followed procedures to resolve plant equipment and component problems. Work performed was typically well-documented.

M1.2 Refueling and Outage Management (62707, 71707)

a. Inspection Scope

The inspectors observed various outage activities including outage shift coordination meetings, risk management (described in Section M1.3), refueling preparations, fuel offloading, fuel loading, fuel inspections, and conditions in containment. The inspectors observed the licensee's handling of the four tritium lead test assemblies (LTAs).

b. Observations and Findings

Outage activities were well-coordinated, with emphasis on risk management and reduction noted. Risk management is documented in Section M1.3. Meeting participants were well-prepared and issues thoroughly covered. Managers were regularly observed in the field involved with outage activities.

Fuel movement preparations were adequate including equipment checkout, prerequisite actions, TS compliance, shift manning requirements, casualty procedures, communications equipment, and procedural controls. Technical Requirements Manual prerequisites were properly implemented. The refueling cavity seal was properly placed and inflation of the air bladder properly controlled. Refueling procedures were properly followed. The licensee found a small amount of debris in the reactor during the Cycle 1 outage (described in NRC Inspection Report 50-390/97-07, Section E7.1) and carefully inspected the inlet nozzle of each fuel assembly as it was offloaded for the Cycle 2 outage. Small pieces of debris were found and removed from 49 fuel assemblies. The inspectors observed both movements of the four LTAs and observed that they were carefully handled and that the required additional security measures were properly implemented.

The inspectors conducted several containment walkdowns during the outage and prior to startup. The inspectors observed that, in general, the licensee maintained positive control of maintenance, foreign material control, and radiological controls in containment.

The inspectors determined that tools, equipment, and debris from the outage were properly removed, however, the inspectors found a few small items in containment prior to closeout.

c. Conclusions

Outage activities were generally well-controlled, with good management oversight and emphasis on risk management. Refueling operations were conducted carefully including handling of LTAs and inspection of fuel assembly inlet nozzles during offload. Outage activities in containment were well-controlled, and the inspectors found the containment closeout to be adequate.

M1.3 Outage Risk Management (62707)

a. Inspection Scope

The inspectors reviewed the Second Refueling Outage Nuclear Safety Plan and reviewed the outage schedule with regard to protection of offsite and onsite power sources and protection of decay heat removal capability. The inspectors reviewed Technical Instruction (TI)-68.002, Containment Penetrations and Closure Control, Revision 2. The inspectors also observed outage management and scheduling meetings.

b. Observations and Findings

The Nuclear Safety Plan was comprehensive and contained both general guidance related to key safety functions, such as decay heat removal and power availability, and plans for specific evolutions, such as reduced inventory/midloop. The inspector observed that the plan stressed defense-in-depth and was adhered to during the outage.

The inspectors reviewed TI-68.002 and periodically verified its use during the outage. Containment openings were effectively tracked along with required closure times and the party responsible for closure.

The licensee integrated risk assessment into outage planning by utilizing the Electric Power Research Institute's computer program entitled Outage Risk Assessment and Management (ORAM). Licensee management focused on risk awareness and reduction by giving an updated risk assessment daily and a briefing of risk level at each outage shift turnover meeting. Any change in the operations or maintenance schedule was evaluated by planners and management using plant experience and ORAM. Several schedule changes were made to minimize risk. Plant operators were briefed each shift about updated risk level and protected equipment. This information was posted in the CR and planning rooms.

c. Conclusions

Licensee management was focused on risk assessment and risk reduction through planning and frequent review. The status of containment openings and closure requirements were effectively tracked. ORAM was an effective tool for the licensee and was utilized extensively to minimize risk and avoid compromising protected train safety and support equipment.

M1.4 Inservice Inspection (ISI) - Observation of Work Activities

a. Inspection Scope (73753)

The inspector observed six ISI ultrasonic and liquid penetrant nondestructive examinations (NDE) of welds and nozzle inter-radius to evaluate the effectiveness of licensee's inservice inspection procedures, examiners' skill, knowledge and thoroughness in their performance of the NDEs, and interpretation/evaluation/acceptance of the test results. Examinations observed were as follows:

- RHRHX-3-1A
- RHRHX-3-1A-IR
- RHRHX-4-1A
- RHRHX-4-1A-IR
- SIS-095
- CVCF-BT199-20

In addition, documentation was reviewed which included scan plans, ISI/NDE procedures, examiner certifications, radiographs, examination results, and evaluations.

b. Observations and Findings

The code of record for the first 10-year inservice inspection interval is the 1989 edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Division 1. The inspector observed ultrasonic and liquid penetrant examinations of the 14-inch diameter residual heat removal heat exchanger (RHRHX) 1A inlet and outlet nozzles including the nozzle inter-radius. All ultrasonic examinations on the RHRHX were conducted using enhanced examination techniques developed for the inside surface of the heat exchanger. The RHRHX had been partially disassembled to allow for eddy current examinations of the heat exchanger tubes. This disassembly also allowed for examination of nozzle welds and nozzle inter-radius which normally would have been inaccessible to examination. The inspector verified the near-surface examination techniques on a mockup block with near-surface notch reflectors. In addition to the RHRHX examinations, ultrasonic examination of one 6-inch safety injection weld, liquid penetrant examination of one 3-inch chemical and volume control weld, and final data resolution and system calibration for the eddy current examination of the loop 4 steam generator tubes were observed.

The inspector noted, during the system calibration for the loop 4 steam generator eddy current examinations, that the 40 percent hole in the calibration standard for the bobbin

examinations was displayed as 32 percent, indicating that the system was either calibrated incorrectly or the calibration standard was inaccurate. Subsequent discussions with the TVA Level III examiner revealed that the hole in the calibration

standard was not accurate. However, for the steam generator tube examinations, all bobbin indications with depth were sized with a motor operated rotating pancake coil and not a bobbin coil. Therefore, this calibration standard discrepancy was not applicable to the test performed. The licensee re-verified the calibration setup on the other three steam generators and determined that they were satisfactory. PER 99-003479 was initiated to have engineering disposition whether the hole in the block or the as-built drawing for the block should be changed and/or what effect, if any, this condition may have on other eddy current tests.

The inspector held discussions with NDE examiners, supervisors, and engineers and reviewed documentation which included; the licensee's ASME Code Section XI ISI/NDE Program (1-TRI-0-10), the Cycle 2 outage scan plan, ISI/NDE procedures, examiner qualifications and certification records, steam generator tube eddy current examination scan plans and eddy current guidelines for the inspection, eddy current examination results for incore flux thimble tube thinning, flow accelerated corrosion (FAC) ultrasonic examinations records of ASME Code feedwater and steam generator blowdown piping, six radiographic film packages of ASME Code feedwater and steam generator blowdown replacement piping and two radiographic film packages of microbiological influenced corrosion (MIC) piping in the MIC growth monitoring program.

The ISI and NDE examination activities that were observed were performed in a skillful manner by certified examiners. Engineering and ISI pre-outage planning to take advantage of access to RHRHX inside surface following eddy current examination and to qualify ultrasonic near-surface weld examination techniques for the inlet and outlet nozzles demonstrated a noteworthy persistence to solve problems and perform valid examinations. Discontinuities were properly recorded, interpreted, evaluated, and dispositioned by knowledgeable examiners using approved procedures. Documentation of eddy current examinations of the incore flux thimble tubes and ultrasonic examinations for FAC in plant piping components revealed that these records were complete and evaluations/ acceptance of examination results were conducted in accordance with applicable procedures, technical specifications and industry standards. The review of the eddy current results for the thimble tubes revealed that at least 4 tubes will have to be plugged. Radiographic film for the feedwater and steam generator blowdown replacement piping welds revealed that the film technique and weld quality were good. The review of the MIC monitoring film revealed no active MIC growth during 1997 and 1998.

c. Conclusions

Inservice examination activities were performed using approved procedures by certified examiners who were skillful in the use of the test equipment, knowledgeable of the test methods, and who properly recorded and evaluated inspection results in accordance with the appropriate test procedures. Documentation reviewed was complete and evaluations/acceptance of examination results were conducted in accordance with the applicable procedures, technical specifications and industry standards. Engineering

demonstrated a noteworthy persistence in solving problems and performing valid examinations.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Turbine-Driven Auxiliary Feedwater (TDAFW) Pump

a. Inspection Scope (62707)

The inspectors reviewed NRC Information Notice (IN) 98-24, Stem Binding in Turbine Governor Valves in Reactor Core Isolation Cooling (RCIC) and Auxiliary Feedwater (AFW) Systems; Terry Turbine Users Group Spring 1998 newsletter; and Maintenance Instruction (MI)-1.003, Disassembly, Inspection, and Reassembly of Auxiliary Feedwater Pump Turbine. In addition, the inspectors observed portions of the maintenance activities associated with the TDAFW pump governor maintenance performed in accordance with MI-1.003.

b. Observations and Findings

IN 98-24 informed the holders of operating licenses for nuclear power reactors of the concern with binding between TDAFW pump inconel governor valve stems and the surrounding carbon spacers. Industry wide, inconel stems replaced 410 stainless steel stems to alleviate stem binding due to corrosion build-up. The Terry Turbine Users Group specified that due to differences in thermal expansion, the inconel stems require an increased cold clearance, 1.5 to 4.0 mils, between the stem and carbon spacers vice 1.0 to 4.0 mils for 410 stainless steel stems. Utilizing MI-1.003, the licensee disassembled the TDAFW pump governor and measured the as-found (cold) dimensions of the inconel stem and carbon spacers. The inspectors determined that the clearances between the stem and the carbon spacers were all in the required 1.5- to 4.0-mil range and there were no indications of stem binding. The governor valve was reassembled using carbon spacers that provided the required clearance. The inspectors observed maintenance activities on the TDAFW pump and determined that personnel involved were knowledgeable in the tasks performed and were following the work instructions.

The inspectors observed the initial start and run of the TDAFW pump conducted under WO 99-000742, which verified pump operation on recirculation flow. The TDAFW pump ran and produced acceptable output pressure. Turbine and pump bearing vibration levels were measured and were within normal limits. Governor response to demand speed changes was smooth and trip testing was satisfactory.

c. Conclusions

The maintenance activities on the TDAFW were adequately performed and well-documented. Review of MI-1.003 and discussions with the licensee revealed that the as-found clearance between the inconel governor stem and the carbon spacers was within the required tolerance and no indications of stem binding were found. The post-maintenance test run was observed by the inspectors and was satisfactory.

III. Engineering

E1 Conduct of Engineering

E1.1 General Observations (37551)

The inspectors observed Engineering support activities for emergent outage issues, PER evaluations, outage surveillances, and other activities such as MRC and PORC meetings. The inspectors also reviewed Safety Assessment/Safety Evaluation (SA/SE) WBPLEE-99-039 for a Technical Requirements Manual change.

Timely and thorough support was noted in the areas reviewed, which included emergent issues and other activities such as MRC and PORC meetings. SA/SE WBPLEE-99-039 was thorough and technically adequate.

E8 Miscellaneous Engineering Issues (92700 and 92903)

E8.1 (Closed) Violation (VIO) 50-390/98-10-03: Failure to Utilize Actual Weights for Ice Basket TS Evaluation. This issue was previously reviewed as described in NRC Report 50-390/98-10, Section M3.2, and resulted in the referenced violation. The violation did not require a licensee response, but had been left open with the option for the licensee to respond within 30 days. The licensee did not respond to the violation and therefore, it is closed.

E8.2 (Closed) EEI 50-390/98-10-05: Testing of Power Operated Relief Valves (PORVs). This issue concerned failure to test the PORVs as required by SIs and commitments originating from GL 90-06, Power Operated Relief Valve and Block Valve Reliability and Additional Low-Temperature Overpressure Protection for Light-Water Reactors. The licensee had maintained testing of the PORVs including full stroke exercising, as required by ASME Section XI, but had not performed full stroke exercising under certain conditions in Mode 4, as required by 1-SI-68-902-A, Valve Full Stroke Exercising During Cold Shutdown: Reactor Coolant A-Train PORV, Revision 3, Section 1.3. This issue was placed in the licensee's corrective action plan as PER 97-1384.

The safety significance of not performing full stroke exercising was small, and the operability of the PORVs was not in question because the licensee maintained the testing of the PORVs as required by TS and ASME Section XI. Also, the recommendations in GL 90-06 were not intended to require testing of the PORVs every time the reactor was shut down. Therefore, the licensee's corrective action of revising this commitment to eliminate this test requirement was not a safety concern. The inspector evaluated the licensee's corrective actions to be adequate. This failure constitutes a violation of minor significance and is not subject to formal enforcement action.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 General Observations (71750)

The inspectors routinely observed radiologically controlled areas (RCAs) to verify adequacy of access controls, locked areas, personnel monitoring, surveys, and postings. The inspectors also observed radiological outage support including briefings, technician awareness, response to personnel monitoring alarms, containment access controls, contamination controls, as low as reasonably achievable (ALARA) emphasis, and coverage for outage activities such as reactor coolant pump seal work.

Radiological controls were adequate. Personnel were attentive and followed requirements. The outage activities observed were performed well with good emphasis on ALARA and contamination control. Briefings were adequate and technicians showed good awareness of conditions.

R1.2 Radiation Control Activities

a. Inspection Scope (83750)

The inspectors reviewed the licensee's activities associated with radiation work permit (RWP) 8140 for work conducted February 27-28, 1999. This RWP was reviewed from the standpoint of radiological controls, radiation surveys, and dose records for the individuals conducting work activities within its authorization. Interviews were conducted with workers and licensee radiation protection personnel involved in this work.

Licensee radiation control activities were evaluated against 10 CFR Part 20 requirements for personnel monitoring, surveys, posting, occupational dose limits, and reporting as specified in 10 CFR Part 20 and procedures required by the TS.

The inspectors also observed the post-shielding survey of the pressurizer surge line.

b. Observations and Findings

The inspector reviewed and discussed with licensee representatives: RWP 8140, for installation of shielding in lower containment; computer printouts of the licensee's REXS database listing radiation dose data for each individual's entry into containment who was working on RWP 8140; radiation survey records for the pressurizer surge line prior to and subsequent to the installation of lead shielding; and employee training. Radiation controls (e.g., dosimetry use, radiation surveys, and job coverage) were implemented in accordance with approved procedures. Radiation survey results for the pressurizer surge line indicated dose rates ranged from 150 to 275 millirem per hour (mrem/hr) prior to, and from 70 to 200 mrem/hr subsequent to installation of the lead shielding.

The NRC also reviewed the radiological doses associated with a worker who performed activities under this RWP about whom questions had been raised regarding his

radiological exposure. The worker's whole-body deep dose equivalent (DDE) radiation exposure, as measured by electronic dosimeters (EDs), was 148 mrem for all lower containment entries made from February 27 through March 1, 1999. The worker's whole-body DDE exposures as measured by ED were consistent with area dose rates and stay-times and also with doses reported for other work crew members. As of March 19, 1999, preliminary radiation dose results for the worker as measured by the thermoluminescent dosimeter (TLD) were within regulatory limits. The preliminary TLD doses reported were shallow dose equivalent (SDE) - 149 mrem, lens dose equivalent (LDE) - 149 mrem, and DDE - 146 mrem. The post-shielding survey measured 50-150 mrem on contact and 30-80 mrem at 30 cm.

From discussions with licensee management, the inspector noted that a review of the event was continuing. The licensee was awaiting additional information pertaining to the identified issue and specific work details to reconstruct the worker's exposure. Licensee's follow-up actions will be reviewed during a subsequent inspection and will be tracked as Inspection Follow-up Item (IFI) 50-390/99-02-01, Review of Potential Personnel Exposure.

c. Conclusions

Licensee actions to evaluate radiation exposure to workers installing lead shielding on the U1 lower containment pressurizer surge line were continuing. The licensee followed established procedures for evaluating the identified event. Radiological controls for work activities associated with the lower pressurizer surge line were in accordance with facility procedures and preliminary exposure results were within regulatory limits. The post-shield survey showed expected values relative to earlier documented dose rates.

R1.3 Radiation Control Activities

a. Inspection Scope (83750)

The inspectors reviewed implementation of selected elements of the licensee's radiation protection program during the current Unit 1 Cycle 2 (U1C2) refueling outage (RFO). The review included observation of radiological protection activities within the RCA, including upper and lower levels of the containment building. Observed activities included personnel exposure monitoring, radiological postings, verification of posted radiation dose rates and contamination levels, and primary coolant shutdown chemistry controls for dose rate reduction. Those activities were evaluated for consistency with the programmatic requirements, personnel monitoring requirements, occupational dose limits, radiological posting requirements, and survey requirements specified in Subparts B, C, F, G, and J of 10 CFR Part 20.

b. Observations and Findings

The inspector conducted frequent tours of the RCA to observe radiation protection activities and practices. Personnel preparing for routine entries into the RCA were

observed being briefed on the radiological conditions in the areas to be entered. The briefings were given by radiation control personnel before access was granted and covered the dosimetry and the protective clothing and equipment required by the RWP for the entry. The administrative limits for the allowed dose and dose rate for the entry were emphasized during the briefings. The briefings provided thorough descriptions of the existing dose rates which could be encountered during the entry. The inspector determined that personnel entering the RCA were adequately briefed on the radiological hazards which could be encountered while in the RCA and the radiological protective measures required to be taken during the entry. During tours of lower containment, the inspector observed installation of equipment for reactor coolant system maintenance and for removal of a steam generator manway cover. During tours of upper containment, the inspector observed removal of reactor head stud bolts. The inspector noted that radiological work practices were consistent with the RWP requirements for those tasks.

The inspector observed the use of personal radiation exposure monitoring devices by personnel entering and exiting the RCA. TLDs were used as the primary device for monitoring personnel radiation exposure. In addition, digital alarming EDs were used for monitoring the accumulated dose and the encountered dose rates during each RCA entry. The EDs were set to alarm at administrative limits established for the specific RWP under which the RCA entry was being made. As the individuals exited the RCA, the accumulated dose and encountered dose rate information was transferred from the EDs to the REXS data base in order to track individual exposures. During tours of the RCA, the inspector noted that the required dosimetry was being properly worn by personnel when entering and while in the RCA. The inspector also noted that personnel exiting the RCA routinely surveyed themselves for contamination using personal contamination monitors (PCMs).

During tours of the RCA, the inspector noted that general areas and individual rooms were properly posted for radiological conditions. Survey maps indicating dose rates and contamination levels at specific locations within the RCA were posted at the entrance to the RCA. Survey maps were also posted at individual contaminated and high radiation areas. At the inspector's request, a licensee health physics technician performed dose rate and contamination surveys in several rooms and locations. The inspector verified that the survey instrument readings were consistent with the posted area dose rates. Independent contamination surveys performed around several posted contaminated areas indicated that contamination was not being tracked out of the contaminated areas.

The inspector compiled the annual and outage collective dose data presented in the table below from the licensee's REXS and ALARA reports. The annual collective doses were verified to be consistent with the REXS data base which is used by the licensee to record and monitor personnel radiation exposure. As indicated in the table, the licensee was successful at meeting established ALARA goals except for fiscal year 1996. The inspector also noted that the annual collective dose of 3.0 Man-Rem for calendar year 1998 was a record low for domestic commercial power reactors.

Collective Dose (Man-Rem)								
Annual Dose					Outage Dose			
Fiscal Year ⁵	Actual	Goal	Calendar Year	Actual	Unit/Cycle	Actual	Goal	Days
1996	5.4 ¹	3.4	1996	15.4 ¹		N/A	N/A	N/A
1997	97.5 ¹	102.4	1997	111.6 ¹	U1C1	97.5 ²	99.0	44
1998	29.0 ¹	34.7	1998	3.0 ^{1,4}		N/A	N/A	N/A
1999	21.8 ^{2,3}	102.2	1999	21.1 ^{2,3}	U1C2	19.5 ^{2,3}	99.0	42

¹ TLD data

² ED data

³ As of 3/5/99

⁴ Record low for domestic commercial power reactors

⁵ October 1 of previous year to September 30 of stated year

The licensee also provided the inspector with data from the REXS data base pertaining to maximum individual radiation exposures for the calendar years 1995 through 1998. The inspector verified that the data were consistent with the REXS data base and tabulated the data in the table below. The administrative annual dose limits established by the license were delineated in Section 3.4.1.6 of Standard Programs and Practices (SPP)-5.1, Radiological Controls, Revision 2. Section 3.4.1.6 of the procedure specified that the 1.0 rem administrative limit could be exceeded only if authorized by the radiological control and chemistry manager, and that exposures exceeding 5.0 rem required authorization by the radiological control and chemistry manager, the plant manager and the site vice president. As indicated in the table, the maximum individual radiation exposures during the calendar years 1995 through 1998 were well within the regulatory limits for occupational dose specified in 10 CFR 20.1201(a).

Maximum Individual Radiation Doses (Rem)				
Calendar Year	TEDE	Skin	Extremity	Eye Lens
1995	0.458	0.474	0.474	0.458
1996	0.200	0.473	0.473	0.202
1997		1.366	4.357	1.254

	1.269			
1998	0.171	0.176	0.225	0.174
Regulatory and Administrative Limits				
10 CFR 20	5.000	50.000	50.000	15.000
Admin.	1.000	None	None	None

The inspector reviewed the licensee's procedures for follow-up actions to personnel contamination events (PCEs) and reviewed selected records for those events which occurred during calendar year 1999. Radiological Control Instruction (RCI)-102, Contamination and Hot Particle Control, Revision 3, indicated that the threshold for initiating follow-up actions was skin or clothing contamination in excess of 100 net counts per minute (ncpm) as measured by a hand held frisker. The licensee's records indicated that nine PCEs occurred prior to the start of the U1C2RFO, which started on February 27, and that 13 occurred during the first six days of the outage. Procedure SSP-5.1, Radiological Controls, specified that skin dose assessments were to be initiated whenever a worker may have received a significant dose (>100 mrem) from skin or personal clothing contamination. The licensee's records indicated that skin dose assessments were initiated for five PCEs involving hot particles, two of which occurred prior to and three after the start of the outage. At the time of this inspection, two of those assessments were complete and the inspector verified that the assigned doses had been entered into the individuals' dose records in the REXS data base. The inspector noted that there were no uptakes of radioactive material in excess of one percent of the Annual Limit on Intake (ALI), and therefore, pursuant to Section 3.4.3.8 of Procedure SPP-5.1, no internal dose assignments were made. No regulatory dose limits were exceeded.

The inspector also reviewed the licensee's records for contaminated floor space within the RCA. Radiological control personnel kept track of the areas within the RCA, excluding containment buildings, which had contamination levels in excess of 1000 disintegrations per minute per 100 square centimeters (dpm/100 cm²). Generally, the licensee maintained the RCA as a clean area. The inspector noted that during January and February, 1999, two small areas, totaling less than 120 square feet, were characterized as contaminated. The licensee indicated that those areas were not normally accessed and, pursuant to ALARA practices, recovery of those areas would be completed during the routine cleanup for the U1C2 RFO.

The inspector reviewed the licensee's plan for primary chemistry controls during the reactor shutdown for the U1C2 RFO. The general plan for the shutdown chemistry controls included early injection of boric acid into the coolant during cooldown followed by injection of hydrogen peroxide after cooldown. The objective of the plan was to reduce radiation fields by causing a controlled release of radioactive materials from the

internal surfaces of the RCS and removing those materials from the coolant by use of the reactor primary water clean-up system. Specific plans consisted of injecting boron at a rapid rate to achieve an acid-reducing environment, controlling the at-temperature pH such that the coolant remained acidic until the coolant changed to an acid-oxidizing environment by the injection of hydrogen peroxide, and maintaining the hydrogen concentration in the coolant at specified levels during cooldown in order to keep the released material in soluble chemical compounds. The inspector determined that the licensee's plan was generally consistent with industry guidelines for shutdown chemistry controls. The licensee monitored and controlled many chemical parameters throughout the shutdown process. The inspector reviewed analytical results for selected chemistry parameters and determined that the licensee had closely monitored and controlled primary coolant chemistry during the shutdown for the U1C2 RFO. One specific goal of the chemistry control plan was to reduce the coolant activity concentration of the hard gamma emitters (^{58}Co , ^{60}Co , ^{134}Cs , ^{137}Cs , and ^{54}Mn) to less than the target activity level of 0.05 micro-Curies per gram ($\mu\text{Ci/gm}$). The hard gamma activity concentration peaked at 1.7 $\mu\text{Ci/gm}$ following the hydrogen peroxide injection and was then reduced to 0.4 $\mu\text{Ci/gm}$ after 20 hours of clean-up operations. The activity concentration remained at approximately 0.4 $\mu\text{Ci/gm}$ for the next 63 hours. Following a second hydrogen peroxide injection, the activity concentration peaked at 1.9 $\mu\text{Ci/gm}$. The activity concentration declined to 0.4 $\mu\text{Ci/gm}$ after an additional 16 hours of clean-up operations, at which point reactor cavity flood-up operations commenced. The licensee indicated that an inquiry would be performed to determine why the target activity level was not achieved.

c. Conclusions

Based on the above reviews and observations, the inspectors concluded that the licensee was properly monitoring and controlling personnel radiation exposure during the Unit 1 Cycle 2 refueling outage and posting area radiological conditions in accordance with 10 CFR Part 20. Personnel entering the RCA were adequately briefed on radiological hazards and protective measures. Maximum individual radiation exposures were controlled to levels which were well within the regulatory limits for occupational dose specified in 10 CFR 20.1201(a). The licensee was successful in meeting established ALARA goals except for fiscal year 1996. The annual collective dose of 3.0 man-rem for calendar year 1998 was a record low for domestic commercial power reactors. The licensee closely monitored primary coolant chemistry during the shutdown for the Unit 1 Cycle 2 refueling outage. The shutdown chemistry control plan was effective in radiation-field reduction by removing radioactive materials from the internal surfaces of the reactor coolant system components; however, the target activity level for clean-up of the coolant was not achieved.

S1 Conduct of Security and Safeguards Activities

S1.1 General Observations (71750)

The inspectors routinely observed security activities for conformance to requirements which included personnel access and package inspections. The inspectors also observed special precautions during handling of tritium test assemblies.

Security personnel performed acceptably and special precautions for handling of tritium assemblies were performed in accordance with procedures.

V. Management Meetings

X1 Exit Meeting Summary

The resident inspectors presented inspection findings and results to licensee management on April 9, 1999. Interim exits were held March 5 and 12, 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
 D. Boone, Superintendent, Radiological Control
 J. Cox, Training Manager
 J. Flanigan, Chairman, Radiological Effects Advisory Group
 L. Hartley, Maintenance Rule Coordinator
 S. Krupski, Site Scheduling 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. Rodden, Operations Training Manager
 S. Spencer, Site Nuclear Assurance Manager
 T. Wallace, Operations Superintendent
 G. Vickery, Chemistry Manager
 J. West, Assistant Plant Manager

NRC

P. Van Doorn, Senior Resident Inspector
 D. Rich, Resident Inspector
 D. Jones, Senior Radiation Specialist
 J. Coley, Reactor Inspector
 T. Morrissey, Project Engineer

INSPECTION PROCEDURES USED

IP 37551	Onsite Engineering
IP 40500	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 61726	Surveillance Observations
IP 62707	Maintenance Observation
IP 71707	Plant Operations
IP 71750	Plant Support Activities
IP 73753	Inservice Inspection
IP 83750	Occupational Radiation Exposure
IP 92903	Engineering Followup
IP 92700	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities

ITEMS OPENED AND CLOSEDOpened

50-390/99-02-01	IFI	Review of Potential Personnel Exposure (Section R1.2)
-----------------	-----	---

Closed

50-390/98-10-03	VIO	Failure to Utilize Actual Weights for Ice Basket TS Evaluation (Section E8.1)
-----------------	-----	---

50-390/98-10-05	EEI	Testing of Power Operated Relief Valves (Section E8.2)
-----------------	-----	--