UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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April 23, 2004

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

SUBJECT: BROWNS FERRY NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT 05000260/2004002 and 05000296/2004002

Dear Mr. Scalice:

On March 27, 2004, the Nuclear Regulatory Commission (NRC) completed an inspection at your Browns Ferry 2 and 3 reactor facilities. The enclosed integrated inspection report documents the inspection results, which were discussed on April 9, 2004, with Mr. Ashok Bhatnagar and other members of your staff.

The inspection examined activities conducted under your licenses as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one NRC-identified finding of very low safety significance (Green). The issue was determined to involve a violation of NRC requirements. In addition, the report documents three licensee-identified violations which were determined to be of very low safety significance and are listed in Section 4OA7 of this report. However, because of their very low safety significance and because they are entered into your corrective program, the NRC is treating these four findings as non-cited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. If you contest any NCV in the enclosed report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Browns Ferry.

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

Sincerely,

/RA/

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

Docket Nos. 50-260, 50-296
License Nos. DPR-52, DPR-68

Enclosure: NRC Integrated Inspection Report 05000260/2004002, 05000296/2004002
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-260, 50-296
License Nos:	DPR-52, DPR-68
Report No:	05000260/2004002 and 05000296/2004002
Licensee:	Tennessee Valley Authority (TVA)
Facility:	Browns Ferry Nuclear Plant, Units 2 & 3
Location:	Corner of Shaw and Nuclear Plant Roads Athens, AL 35611
Dates:	December 28, 2003 - March 27, 2004
Inspectors:	B. Holbrook, Senior Resident Inspector E. Christnot, Resident Inspector R. Monk, Resident Inspector R. Carrion, Project Engineer (Section 1R06) W. Bearden, Senior Resident Inspector, Unit 1 (Section 1R08) M. Maymi, Reactor Inspector (Sections 1R02, 1R17) A. Nielsen, Health Physicist (Sections 2OS1, 4OA1) D. Jones, Senior Health Physicist (Sections 2PS1, 4OA1) E. Testa, Senior Health Physicist (Sections 2OS3, 2PS3) K. VanDoorn, Senior Reactor Inspector (Sections 1R02, 1R17) S Vias, Senior Reactor Inspector (Sections 1R02, 1R17)
Approved by:	Stephen J. Cahill, Chief Reactor Project Branch 6 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000260/2004-002, 05000296/2004-002; 12/28/2003 - 3/27/2004; Browns Ferry Nuclear Plant, Units 2 and 3; Radiation Monitoring Instrumentation.

The report covered a three-month period of inspection by resident inspectors, Radiation Protection specialists, Engineering specialists, and a Region II Project Engineer. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector-Identified and Self-Revealing Findings

Cornerstone: Occupational Radiation Safety

Green. The inspectors identified a Non-Cited Violation of 10 CFR 20.1501(b) for failure to ensure that instruments and equipment used for quantitative radiation measurements (e.g., area radiation monitors) were calibrated at an adequate periodicity for the radiation measured.

The inspectors determined that the licensee's failure to ensure that area radiation monitors were calibrated at an appropriate periodicity for the radiation measured was a performance deficiency. This finding is greater than minor because it is associated with the Occupational Radiation Safety Cornerstone and adversely affects the cornerstone objective attribute to ensure the adequate protection of worker health and safety from exposure to radiation from radioactive material. The finding is of very low safety significance because there are other instrumentation and means to identify degraded operation involving a radioactive material release, and no known operational event occurred during this period. (Section 2OS3).

B. Licensee-Identified Findings

Three violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violations and corrective action tracking numbers are listed in Section 4OA7.

Report Details

Summary of Plant Status

Unit 2 operated at about 100% Rated Thermal Power (RTP) during the report period with the exception of power reductions to conduct scheduled testing and maintenance.

Unit 3 operated at or near 100% RTP until about February 1 when end-of-cycle coast down began. Unit power was reduced to 75% RTP on February 8 and feedwater temperature reduction activities began for end-of-cycle coast down. The unit began the scheduled cycle 11 refueling outage on March 1. At the end of the inspection period on March 27, the unit was still shutdown with refueling activities ongoing.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R02 Evaluations of Changes, Tests, or Experiments

a. Inspection Scope

The inspectors reviewed selected samples of evaluations to confirm that the licensee had appropriately considered the conditions under which changes to the facility or procedures may be made and tests conducted without prior NRC approval. The inspectors reviewed evaluations for various design and procedure changes. The inspectors reviewed additional information, such as calculations, supporting analyses and drawings to determine if the licensee had appropriately concluded that the changes could be accomplished without obtaining a license amendment. The ten evaluations reviewed are listed in the List of Documents Reviewed.

The inspectors also reviewed samples of design/engineering packages and procedure changes, for which the licensee had determined that evaluations were not required, to verify that the licensee's conclusions to "screen out" these changes were correct and consistent with 10 CFR 50.59. The 16 "screened out" changes reviewed are listed in the List of Documents Reviewed.

The inspectors reviewed the licensee's corrective action program and self-assessments of the 50.59 process to confirm that the licensee was identifying 10 CFR 50.59 issues, entering issues into the corrective action program, and resolving concerns.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed a partial walkdown of the three safety systems listed below to verify redundant or diverse train operability, as required by the plant Technical Specifications (TSs). In some cases, the system was selected because it would have been considered an unacceptable combination from a Probabilistic Safety Assessment (PSA) perspective for the equipment to be removed from service while another train or system was out of service. The inspectors' verified that selected breaker, valve position, and support equipment were in the correct position for support system operation. Also, the walkdown was done to identify any discrepancies that could impact the function of the system and lead to increased risk. The inspectors reviewed that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the availability and functional capability of mitigating systems or barriers. The inspectors' observations of equipment and component alignment for the partial walkdowns were compared to the licensee alignment procedures specified in the attachment.

- Diesel Generator 3A and AC power lineup per OI-57, while Diesel Generator 3B was inoperable for testing
- Unit 1 Control rod drive (CRD) system while Unit 2 CRD system was out of service for maintenance activities
- Units 2 and 3 4-kV distribution system for dedication to Unit 3 during outage

.2 Complete Walkdown

The inspectors conducted a complete walkdown of the Unit 2 Reactor Core Isolation Cooling system. The inspectors reviewed licensee procedures and plant drawings and conducted a detailed walkdown in the main control room, at the remote shutdown panel, electrical board rooms, and assessable equipment and components in the plant. The inspectors review and walkdown was to verify that component switch, valve, and breaker position was as required by procedure to ensure that the Unit 2 Reactor Core Isolation Cooling system was in the required standby configuration. The inspectors observed the material condition of components to verify that equipment appeared in good working order with no leaks or degradation. The inspectors also observed local and control room instruments to verify that they indicated system parameters as expected by licensee procedure and Technical Specifications. Licensee procedures and plant drawing's reviewed and used to verify correct alignment are listed in the attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (Walkdown and Drill Observation)

a. Inspection Scope

The inspectors reviewed licensee procedure, SPP-10.10, Control of Transient Combustibles, and SPP-10.9, Control of Fire Protection Impairments, and conducted a walkdown of the six fire areas or fire zones listed below in order to verify a selected sample of the following: licensee control of transient combustibles and ignition sources; the material condition of fire equipment and fire barriers; operational lineup; and operational condition of selected components. Also, the inspectors verified that selected fire protection impairments were identified and controlled in accordance with procedure SPP-10.9. In addition, the inspectors reviewed the Site Fire Hazards Analysis (FHA) and applicable Pre-fire Plan drawings to verify that the necessary fire fighting equipment, such as fire extinguishers, hose stations, ladders, and communications equipment, was in place. The inspectors observed some ongoing maintenance activities and flow testing of Emergency Firepump B, completed per procedure EPI-0-000-TST001 and EPI-0-000-MOT002, to verify that pump flow and operation were as described in the FHA. The inspectors reviewed a sampling of fire protection-related Problem Evaluation Reports (PERs) to verify that the licensee was identifying and correcting fire protection problems. Pre-fire Plan drawings and documents reviewed are listed in the attachment to the report.

- Fire Area 25, Turbine Buildings North Wall (transient combustibles)
- Fire Zone 2-3, 2-4 and 2-5, Unit Reactor Building Elevation 593 and 621
- Fire Zone 3-3, 3-4, Unit 3 Reactor Building Elevation 593 and 621
- Fire Area 8, Unit 2, 4-kV Shutdown Board D
- Fire Area13, Unit 3 Shutdown Board E
- Fire Area 23, Unit 3 Diesel Generator Building 4-kV shutdown board 3EC and 3ED

Fire Drill: The inspectors observed an announced fire drill at the Unit 3 4-kV shutdown board 3ED on February 10. The inspectors assessed fire alarm effectiveness, time used to notify and assemble the fire brigade, the selection and placement of equipment, communications, teamwork, and fire fighting strategies. The inspectors also attended the post-drill critique to assess licensee actions to review fire brigade performance and identify areas for improvement. The inspectors compared their observations with the licensee's observations and to the requirements specified in the licensee's fire protection report.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors reviewed plant design features and licensee procedures intended to protect the plant and its safety-related equipment from flooding events. The inspectors reviewed flood analysis documents including: UFSAR Section 2.4, Hydrology, Water Quality, and Marine Biology, which included Appendix 2.4A, Maximum Possible Flood, for licensee commitments. The inspectors also interviewed cognizant licensee personnel knowledgeable about site flood protection measures and plant drainage plans. For external flooding protection features, the inspectors performed walkdowns of risk-significant areas, susceptible systems and equipment including the Intake Pumping Station Rooms “A” and “D” and the 500-kV Switchyard Cable Tunnels. For internal flooding protection features, the inspectors performed walkdowns of the Units 1/2 Diesel Generator Rooms, including the portable bulkhead, shown on Drawing 46W401-16, and cable/piping wall penetrations in Rooms “C” and “D,” referenced on Drawing 47W585-1, as well as floor drain plugs stored in the hallway (Elevation 565'). In addition, the inspectors walked down the Unit 3 Diesel Generator Rooms, including the portable bulkhead, shown on Drawing 46W401-20, to review flood-significant features such as level switches, room sumps, and door seals. Plant procedures for coping with flooding events were also reviewed to verify that licensee actions were consistent with the plant’s design basis assumptions. The reviewed procedures are listed in the attachment.

The inspectors also reviewed licensee corrective action documents for flood-related items identified in PERs written from late 2002 through 2003 to verify the adequacy of the corrective actions. The inspectors reviewed selected completed preventive maintenance procedures and work orders for identified level switches and pumps for completeness and frequency.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors conducted a review of the licensee’s heat exchanger performance program, which consisted of periodically disassembling the safety-related heat exchangers, cleaning, inspecting, eddy current testing heat exchanger tubes, plugging defective tubes, and reassembling the heat exchangers, to verify that the requirements in the licensing bases documents were met. The inspectors reviewed procedures N-ET-6, Eddy Current Testing, work order (WO) 30-009252-000 and WO 03-009253-000, to ensure that the RHR system heat exchangers 3C and 3D would be able to supply the necessary cooling as described in the UFSAR, Sections 4.8 and 6.4.4. The inspectors also reviewed licensee procedure SPP-9.7, Corrosion Control

Program, and 0-TI-389, Raw Water Fouling and Corrosion Control, to verify that procedure requirements were being met for system and heat exchanger inspections. The inspection focused on deficiencies that could mask degraded performance of the heat exchangers and/or result in common cause heat exchanger performance problems. Also assessed was whether the licensee had adequately identified and resolved heat sink performance problems that could affect multiple heat exchangers in mitigating systems.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (ISI)

a. Inspection Scope

The inspectors observed in-process ISI work activities on Unit 3 and reviewed selected ISI records. The observations and records were compared to the Technical Specifications (TSs) and the applicable code (ASME Boiler and Pressure Vessel Code, Sections V and XI, 1989 Edition, no Addenda) to verify compliance.

Calibration of Ultrasonic (UT) examination equipment and portions of the ongoing manual UT examination of ten-inch high pressure core injection (HPCI) pipe weld 3-THPCI-3-071, one ten-inch HPCI pipe weld 3-THPCI-3-072, and the reactor vessel head vent six-inch nozzle N6B weld were observed. Magnetic Particle (MT) dry power examination of ten-inch HPCI pipe weld attachment 3-47B455-621-IA was observed. In addition, the inspectors reviewed nondestructive examination (NDE) reports for the following completed MT, Liquid Penetrant (PT) and UT examinations:

UT Report	Component
R117	Unit 3 Recirc Pump A studs PMP-A-STUD-1 through -8 and studs PMP-A-STUD-10 through -16
R118	ASME Class 2 RHR piping weld, DRHR-3-4
R119	ASME Class 2 RHR piping weld, DRHR-3-7
R013	ASME Class 2 RHR Heat Exchanger 3B Shell to Flange weld RHRG-3-09-B
R014	ASME Class 2 RHR Heat Exchanger 3B Shell to Flange weld RHRG-3-10-B

MT Report	Component
R012	ASME Class 2 RHR Heat Exchanger 3B vessel weld attachment, RHRG-3-14-B-IA
R007	ASME Class 2 piping weld attachment, 3-47B464-437-IA

PT Report	Component
R070	ASME Class 1 piping weld attachment, 3-47B465-482-IA
R089	ASME Class 1 piping weld attachment, 3-47B458-558-IA
R090	ASME Class 1 piping weld attachment, 3-47B465-497-IA

The inspectors reviewed the weld examination reports and radiographs of the following completed weld repairs:

Weld RADW-3-001-007	Three-inch ASME Class 2 Drywell floor drain piping weld
Weld HPCI-3-004-002	Ten-inch ASME Class 1 HPCI Steam Supply piping weld
Weld HPCI-3-004-003	Ten-inch ASME Class 1 HPCI Steam Supply piping weld
Weld HPCI-3-004-004	Ten-inch ASME Class 2 HPCI Steam Supply piping weld

The inspectors also reviewed NDE examination reports R172, nozzle to vessel weld UT, and R173, inner radius UT, for the Unit 3 reactor pressure vessel (RPV) Nozzle, control rod drive (CRD) return line. These UT exams had been previously performed during refueling outage RFO10 with no recordable indications. The CRD return nozzle was selected for review due to a recent event involving stress corrosion cracking of the capped CRD return line at another boiling water reactor (BWR).

The inspectors also observed various ongoing augmented inspections included in the licensee's Vessel Internals Program (VIP). This included observation of portions of remote automated UT examinations of RPV shroud weld H5 and remote visual inspection of portions of vertical shell welds on the RPV. In addition, the inspectors reviewed selected portions of completed remote visual inspections of jet pumps 4, 19, 20 and the steam dryer.

Qualification and certification records for examiners, equipment and consumables, and NDE procedures for the above ISI examination activities were reviewed. Various Notice of Indications (NOI) reports associated with minor coatings and piping support deficiencies identified during ongoing outage were reviewed by the inspectors. NOI U3C10-002, which documented a minor linear indication in weld RHRG-3-06B-B from previous refueling outage RFO10 was reviewed. In addition, five Problem Evaluation Reports (PERs) associated with ISI activities which had been documented in the licensee's corrective action program were reviewed

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

Resident Inspector Quarterly Review of Training Activities

a. Inspection Scope

The inspectors observed an operations crew performance during part of licensee Simulator Evaluation Guide, 177079, Loss of 480-V Shutdown Board; Loss of Reactor Building Ventilation; Main Steam Line Leak; Hydraulic ATWS: SLC Failure, and a different crews' performance of part of OPL173S001, Reactor Startup and Heatup, to verify that performance was in accordance with licensee procedures and regulatory requirements. The inspectors reviewed licensee procedures TRN-11.4, Continuing Training for Licensed Personnel, TRN-11.9, Simulator Exercise Guide Development and Revision, and OPDP-1, Conduct Of Operations, to verify: the conduct of training; that the exercises contained high-risk operator actions; and that the formality of communication, procedure usage, alarm response, control board manipulations, and supervisory oversight were in accordance with the above procedures.

The inspectors also reviewed previously identified deficiencies to verify they that were included in the current training. The inspectors attended the post-exercise critiques to verify that the licensee-identified issues were comparable to issues identified by the inspectors.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

.1 Routine Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the two items listed below for the following: (1) appropriate work practices; (2) identifying and addressing common cause failures; (3) scoping in accordance with 10 CFR 50.65(b) of the maintenance rule (MR); (4) characterizing reliability issues for performance; (5) trending key parameters for condition monitoring; (6) charging unavailability for performance; (7) classification and re-classification in accordance with 10 CFR 50.65(a)(1) or (a)(2); and (8) appropriateness of performance criteria for Systems, Structures and Components (SSCs)/functions classified as (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSCs/functions classified as (a)(1). The inspectors also compared the licensee's performance against site procedure SPP-6.6, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting; Technical Instruction 0-TI-346, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting; and SPP 3.1, Corrective

Action Program. The inspectors also reviewed applicable WOs, engineering evaluations and system testing to verify that regulatory and procedural requirements were met.

- 3C and 3D Emergence Diesel Generator (EDG) relays, type Square D model number CO2E/9050, failed to meet as-found requirements during the performance of surveillance testing. These relays were experiencing out-of-calibration for time delay requirements. The out-of-calibration conditions for the time delay of the relays were documented as part of the licensee's corrective action program in four PERs on the 3C EDG and five PERs on 3D EDG. The relays are in the EDG starting logic and are redundant. The licensee also issued PER 04-000037-00 to perform an evaluation to determine if an adverse trend existed for this type of relay. The evaluation indicated that the as-found time delays were within the normal expected instrument drift for this type of relay. The expected drift did not represent an adverse trend and the operability of the 3C and 3D EDGs was not affected.

- During performance of 3-SR-3.5.1.6(CS I), Core Spray Loop I Flow Rate, the 3C Core Spray Pump had a leak of 200 ml per minute with no pumps running and 1.5 liters per minute (l/min) with both Loop 1 pumps in service. This leak had been previously identified and WO 03-015635-000 initiated when the leakage was 12 drops per minute (dpm) with the pump running. The location of the leak was identified at a ½-inch threaded connection on the 12-inch discharge line of the pump. PER 04-000739-000 was written to evaluate the increased leakage. The evaluation determined that the leakrate for the containment was within acceptable values and structural integrity of the system was satisfactory. The leak did not affect pump operability or maintenance rule availability for the system. The ½-inch threaded connection was replaced satisfactorily during U3C11 refueling outage. Additional documents reviewed are none specific to this sample.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

For the six emergent work and equipment issues listed below, the inspectors reviewed licensee actions taken to plan and control the emergent work activities to effectively manage and minimize risk. The inspectors verified that risk assessments were being performed as required by 10 CFR 50.65(a)(4). The inspectors reviewed: licensee procedure SPP-6.1, Work Order Process Initiation; SPP-7.1, Work Control Process; and 0-TI-367, BFN Dual Unit Maintenance, to verify that procedure steps and required

actions were met. Also, the inspectors evaluated the adequacy of the licensee's risk assessments and the implementation of compensatory measures.

- Unit 2, Control Rod Block Monitor, troubleshoot and repair per WO 04-711106-000
- Unit 2, B Emergency Diesel Generator was declared inoperable due to the addition of the wrong type of oil per WO 04-712122-00 and PER 04-01560-00 (emergent)
- Unit 3, Repair/Replace scram discharge volume reactor protection level switch 3-LS-85-45F per WO 04-711384-003
- Unit 3, 3D RHR pump declared inoperable due the room cooler failing a flow test per WO 03-019548-00 and PER 04-001203-00 (emergent)
- Unit 3, Leak on Core Spray Pump 3C with and without pump running, per WO 03-015635-000, PER 04-000739-000 (emergent)
- Unit 3, 3ED Emergency Diesel Generator was declared inoperable due to the EDG output breaker failing to open when given a trip signal from a simulated common accident logic signal during testing per WO 04-712707-00 and PER 04-001755-00 (emergent)

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

.1 Routine Baseline Review

a. Inspection Scope

The inspectors reviewed the six operability evaluations listed below to verify technical adequacy and ensure that the licensee had adequately assessed TS operability. The inspectors reviewed the UFSAR to verify that the system or component remained available to perform its intended function. In addition, the inspectors reviewed implemented compensatory measures to verify that the compensatory measures worked as stated and that the measures were adequately controlled. Where applicable, the inspectors reviewed licensee procedure SPP-3.1, Corrective Action Program, Appendix D, Guidelines For Degraded/Non-conforming Condition Evaluation and Resolution of Degraded/Non-conforming Conditions, to ensure that the licensee's evaluation met procedure requirements. The inspectors also reviewed a sampling of PERs to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations.

- Unit 2 HPCI main steam line pressure switch replacement per WO 04-710654
- Unit 2 boron depletion exceeded limits on eight control rods per PER 04-001562

- Unit 2 operability of six of twelve drywell-suppression chamber vacuum breakers which failed light position indication during performance of a surveillance test, per PER 03-025237-000 with WO's 03-025228-00 and 03-025229-00
- Unit 3 operability of a safety-related seismic class 1 HVAC duct in the control room habitability zone which was mis-identified as non-seismic per PER 04-000136-000
- Unit 3 operability of damper 3-DMP-64-10 which failed to close when the reactor zone ventilation system was removed from service per PER 04-000723-00
- Unit 3C CS pump discharge fitting leak (1.5 l/min) per WO 03-015635-000

b. Findings

No findings of significance were identified.

.2 Operability of Type HFA Relays

a. Inspection Scope

The inspectors observed and reviewed the licensee's activities involved with General Electric type HFA relays to verify that requirements of procedure SPP-3.1, Corrective Action Program, Appendix D, Guidelines For Degraded/Non-conforming Condition Evaluation and Resolution of Degraded/Non-conforming Conditions, were met. On September 18, 2003, the licensee identified that a piece from a broken lexan relay coil spool had interfered with the operation of a relay in the Unit 1 and 2 Emergency Diesel Generator (EDG) D. The relay did not affect the EDG in performance of its automatic safety function. Further inspections by the licensee revealed that a relay in the Unit 1 and 2 EDG A also had a broken spool. The licensee established a plan to inspect all of the HFA relays installed in operating Units 2 and 3. The licensee determined the total number of relays to be: Safety Related - 1,378; Quality Related - 164; Non-Quality Related - 61; Non-Classified - 738, for a total population of 2,341. The licensee continued with their inspection plan and initiated PERs and work orders (WOs) when necessary. The inspectors reviewed the licensee's inspection plan and operability evaluations, and observed selected relay inspections to verify that the procedure and regulatory requirements were met. This problem was entered into the licensee's corrective action program as PER 03-018067.

b. Issues and Findings

No findings of significance were identified.

1R16 Operator Work-Around (OWA) Review

a. Inspection Scope

The inspectors reviewed the status of OWAs for Units 2 and 3 to determine if the functional capability of the associated system or operator reliability in responding to an initiating event was affected by the OWA. The inspectors evaluated the effect of the OWA on the operator's ability to implement abnormal or emergency operating procedures during transient or event conditions. The inspectors conducted a detailed review of two OWAs. The inspectors also verified that the OWAs had been reviewed in accordance with site procedures and that work orders had been developed, prioritized, and scheduled for repair. The inspectors also reviewed recently completed work packages to verify that OWAs were corrected as scheduled. The inspectors compared their observations and licensee actions to the requirements of Operations Directive Manual 4.11, Operator Work Around Program, and TVAN Standard Department Procedure OPDP-1, Conduct of Operations. Cumulative affects of the following OWAs were assessed:

- Priority 2 OWA, 0-065-OWA-2002-0010, A train of Standby Gas Treatment in service and the B train in standby associated with the relative humidity heaters, PER 04-7111281-00
- Priority 1 OWA, 3-005-OWA-2004-0015, associated with 3B3 feedwater heater extraction steam isolation valve not being able to close, PER 04-001579-00

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors evaluated design change packages for ten modifications, in all three reactor (R) cornerstone areas, to verify that the modifications did not affect system availability, reliability, or functional capability. The inspectors reviewed inspection procedure attributes such as: energy requirements supplied by supporting systems under accident/event conditions; compatibility of materials and replacement components with physical interfaces; seismic qualification for replacement component application; Code and safety classification of replacement system, structures, and components consistency with design bases; appropriate modification design assumptions; post-modification testing establishment of operability; bounding by existing analyses of failure modes introduced by the modification; and initiation of appropriate procedures or procedure changes. For selected modification packages, the inspectors verified that the as-built configuration accurately reflected the design documentation.

Documents reviewed included procedures, engineering calculations, modifications, work orders, site drawings, corrective action documents, applicable sections of the UFSAR, supporting analyses, Technical Specifications, and design basis documentation.

The inspectors also reviewed the results of the licensee's recent self-assessments of the design change process.

DCN-51312 Replace Recirc. MG Sets, 3A & 3B, with Robicon Variable Frequency Drives (VFD)(Initiating Events, Mitigating Systems)

DCN-50869 Issue Remainder of Design Change to Replace MG Sets 2A & 2B with Robicon VFDs (Unit 2)(Initiating Events, Mitigating Systems)

DCN-51308 RR/RHR/RWCU Vibration Monitoring Equipment Supports Addition (Initiating Events)

DCN-50870 Relocate Temperature Elements in Main Steam Vault (Initiating Events, Mitigating Systems)

DCN-50287 HPCI Valve Replacements on the Inboard and Outboard Isolation Gate Valves (Mitigating Systems, Barrier Integrity)

DCN-50843 Installation of Main Steam Vault Exhaust Duct Booster Fan for Unit 2

EDC-51371 Removal of HPCI Steam Trap Piston (Mitgating Systems)

DCN-50830 Addition of Drop Leg/Sediment Trap to PSC Head Tank RHR "Keep-Fill" Lines (Mitgating Systems)

DCN-51426 Replace or Remove Under Frequency Relay Which Prevents MMG Set 2/Set 3 Startup (Mitigating Systems)

DCN-50897 Scram Discharge Instrument Volume Instrument and Piping Changes (Mitigating Systems)

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (PMT)

a. Inspection Scope

The inspectors evaluated the following six activities by observing testing and/or reviewing completed documentation to verify that the PMT was adequate to ensure system operability and functional capability following completion of associated work. The

inspectors reviewed licensee procedure SPP-6.3, Post-Maintenance Testing, to verify that testing was conducted in accordance with procedure requirements. For some testing, portions of MMDP-1, Maintenance Management System, were referenced.

- Unit 2, PMT on Unit 2 Reactor Core Isolation Cooling (RCIC) Pump following pump alignment per 2-SR-3.5.3.3, RCIC System Rated flow at Normal Operating Pressure.
- Unit 2, PMT on Unit 2 Core Spray Div II following Backup Control Panel Testing per 2-OI-75 Core Spray System Operating Instruction.
- Unit 0, PMT for Emergency Firepump "B" motor per 0-OI-26 for WO 03-015530-000
- Unit 3, PMT for 3-LS-085-0045F Scram Discharge Volume Level Switch per WO 04-711384-003.
- Unit 2, PMT for Residual Heat Removal system room cooler 2A following maintenance and flow adjustment per WO 03-010792
- Unit 3, Emergency Diesel output breaker following Auxiliary Switch (MJ) adjustments per WO 04-712707-000.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

Unit 3 Scheduled Refueling Outage

b. Inspection Scope

Schedule Risk Assessment

Prior to the Unit 3 scheduled 25-day refueling outage that began on March 1, the inspectors reviewed the Outage Risk Assessment Report, to verify that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing an outage plan that assured defense-in-depth of safety attributes was maintained. The inspectors specifically reviewed the contingency plans for two evaluated risk conditions of Orange for the decay heat removal and AC power systems during the outage to verify that specific protective actions of equipment were identified. The inspectors' review was compared to the requirements in licensee procedure SPP-7.2, Outage Management. The review was also done to verify that, for identified high risk significant conditions, due to equipment availability and/or system configurations, contingency measures were identified and incorporated into the overall outage and response plan. The inspectors frequently discussed posted risk conditions with operations and outage personnel to assess licensee personnel knowledge of the risk condition and mitigation strategies.

Shutdown and Cooldown Process

The inspectors observed selected activities and monitored licensee controls over outage activities listed below to verify that procedural and regulatory requirements were met. The inspectors compared their observations to licensee procedure SPP-12.1, Conduct of Operations, and 2-GOI-100-12A, Unit Shutdown from Power Operations to Cold Shutdown and Reduction in Power During Power Operations, to verify that procedure requirements were met. Part of the activities observed included the following:

- Unit power reduction with control rods and recirculation system flow
- Manual scram of unit and recovery actions
- Core thermal limit verification
- Reactivity monitoring and control
- Startup, shutdown, and realignment of components and systems
- Realignment and transfer of AC power sources
- TS instrument and system performance verification

Decay Heat Removal

The inspectors reviewed licensee procedures 3-OI-74, Residual Heat Removal System (RHR); 3-OI-78, Fuel Pool Cooling and Cleanup System; Abnormal Operating Instruction 0-AOI-72-1, Auxiliary Decay Heat Removal System Failures; and conducted a main control room panel and in-plant walkdown of system and components to verify correct system alignment. During the increased outage risk condition of Orange for the removal of decay heat, inspectors verified that the plant conditions and systems identified in the risk mitigation strategy were available to remove decay heat. The inspectors reviewed operational logs to verify that procedure and TS requirements to monitor and record reactor coolant temperature were met. In addition, the inspectors reviewed controls implemented to ensure that outage work was not impacting the ability of operators to operate spent fuel pool cooling and RHR shutdown cooling.

Reactivity Control

The inspectors observed licensee performance during shutdown, outage, refueling, and startup activities to verify that reactivity control was conducted in accordance with procedure and TS requirements. The inspectors conducted a review of outage activities and risk profile to verify that activities that could cause reactivity control problems were identified. Inspector observations were compared to procedure SPP-10.4, Reactivity Management, to verify that procedure and TS requirements were met. Reactivity manipulations observed included the following:

- Power reduction with control rods and recirculation flow
- Fuel movement during core off load and reload and during fuel sipping activities

Inspectors observed the following items to assess licensee performance in the respective area:

Inventory Control

- Reactor water inventories and controls including flow paths, system configurations, and alternate means for inventory addition
- Operator monitoring and control of reactor temperature and level profiles

Electrical Power

- Controls over electrical power systems and components to ensure that emergency power was available as specified in the outage risk report
- Controls and monitoring of electrical power systems and components and work activities in the power transmission yard
- Operator monitoring of electrical power systems and outages to ensure that TS requirements were met
- Review of clearance activities to verify that equipment was identified and controlled to support work and testing activities and that equipment was correctly returned to service or standby conditions

Containment Control and Closure

- Confirm secondary containment requirements
- Verify that leak rate and cold shutdown valve testing results met TS requirements
- Verify torus closeout
- Complete drywell walkdown and closeout prior to unit restart

Refueling Activities

- Fuel sipping to identify leaking fuel
- Core alterations
- Reactor vessel reassembly activities

Additional Procedures and documents reviewed are listed in the attachment of the report.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors either witnessed portions of surveillance tests or reviewed test data for the six risk-significant SSC's listed below to verify that the tests met TS surveillance requirements, UFSAR commitments, and in-service testing (IST) and licensee procedure

requirements. The inspectors' review was to confirm that the testing effectively demonstrated that the SSCs were operationally capable of performing their intended safety functions and fulfilled the intent of the associated surveillance requirement. IST data was compared against the requirements of licensee procedures 0-TI-362, Inservice Testing of Pumps and Valves, and 0-TI-230, Vibration Monitoring and Diagnostics. The surveillances either witnessed or reviewed included:

- 0-SR-3.8.1.6, Common Accident Logic Surveillance
- 2-SR-3.3.3.2.1 (75II), Backup Control Panel Testing
- 2-SR-3.5.3.3, RCIC Flow Operability (IST)
- 3-SR-3.8.1.1(3B), Diesel Generator 3B Monthly Operability Test
- 3-SR-3.3.1.1.8, 3-LS-085-0045F, Scram Discharge Volume Level Switch
- 3-SR-3.8.4.4 (3B) 3, EDG Battery Test

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed licensee procedures 0-TI-405, Plant Modifications and Design Change Control; 0-TI-410, Design Change Control; SPP-9.5, Temporary Alterations; and the temporary modification listed below to ensure that procedure and regulatory requirements were met. The inspectors reviewed the associated 10 CFR 50.59 screening against the system design bases documentation to verify that the modifications had not affected system operability/availability. The inspectors reviewed selected completed work activities and walked down portions of the systems to verify that installation was consistent with the modification documents and Temporary Alteration Control Forms (TACFs).

- TACF 0-03-003-090, Install new flow control system in the Wide Range Gaseous Radiation Monitoring System due to multiple failures and obsolescence

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed the performance of the licensee's emergency response organization (ERO) during the 2004 Severe Accident Management Guidelines (SAMG)

Drill conducted on February 11. The inspectors observed operator performance in the simulated control room, ERO performance in the Technical Support Center and Operations Support Center. The drills focused on degraded plant conditions that led to implementation of the Emergency Operating Procedures that resulted in a classification of a General Emergency and implementation of SAMG procedures. The inspectors review was to verify implementation of licensee procedures NP-REP, Radiological Emergency Plan; Browns Ferry Emergency Plan Implementing Procedures; SPP-3.5, Regulatory Reporting Requirements; and OPDP-1, Conduct of Operations. The inspectors assessed operator performance, formality of communications, event classifications, and offsite emergency notifications to verify that they were in accordance with the requirements of the above-referenced procedures. In addition, procedure usage, alarm response, control board manipulations, and supervisory oversight were evaluated to verify that the procedure requirements were met. The inspectors also reviewed drill documents to verify that drill evaluations focused on improvement items identified during previous drills. The inspectors attended the post-exercise critiques and reviewed the licensee's post-drill report to verify that the licensee-identified issues were comparable to issues identified by the inspectors. The inspectors reviewed the drill objectives to verify that licensee actions met the requirements of the objectives.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety (OS)

2OS1 Access Control To Radiologically Significant Areas

a. Inspection Scope

Access Controls. The inspectors assessed licensee activities for monitoring workers and controlling access to radiologically significant areas. The inspectors evaluated procedural guidance and directly observed implementation of administrative and physical controls; appraised radiation worker and technician knowledge of, and proficiency in implementing, radiation protection program activities; and assessed worker exposures to radiation and radioactive material.

Radiological postings and material labeling were directly observed during tours of the Unit 2 (U2) and Unit 3 (U3) turbine and reactor buildings and radwaste processing areas. The inspectors conducted independent surveys in these areas to verify posted radiation levels and to compare them with current licensee survey records. During the plant tours, control of Locked High Radiation Area (LHRA) keys and the physical status of LHRA doors were examined. In addition, the inspectors observed radiological controls for non-fuel items stored in the spent fuel pools (SFPs). The inspectors also reviewed selected parts of seven Radiological Control (Radcon) procedures, two radiation work permits (RWPs), and discussed current access control program implementation with Radcon supervisors.

During the onsite inspection, radiological controls for work activities in High Radiation Areas (HRA) were observed and discussed. The inspectors attended a pre-job briefing for clean-up work in the Control Rod Drive (CRD) rebuild room and directly observed the work activities involved. The inspectors observed workers' adherence to RWP guidance and Health Physics Technician (HPT) proficiency in providing job coverage. Controls for limiting exposure to airborne radioactive material were reviewed and operation of ventilation units and positioning of air samplers were also observed. The inspectors evaluated electronic dosimeter alarm setpoints for consistency with radiological conditions in and around the CRD rebuild room. In addition to observing the clean-up activities, the inspectors interviewed workers in the U2 and U3 turbine buildings to assess their knowledge of RWP requirements.

The inspectors evaluated worker exposures through review of data associated with discrete radioactive particle (DRP) and dispersed skin contamination events. Controls used for monitoring extremity dose during SFP diving operations conducted in June, 2003, were also reviewed.

Radcon program activities were evaluated against 10 CFR Part 20; Technical Specification (TS) Sections 5.4, Procedures, and 5.7, HRA; Regulatory Guide 8.38, Control of Access to High and Very High Radiation Areas in Nuclear Power Plants; and approved licensee procedures. Licensee guidance documents, records, and data reviewed are listed in the report Attachment.

Problem Identification and Resolution. Three Problem Evaluation Reports (PERs) and one audit associated with radiological controls, personnel monitoring, and exposure assessments were reviewed and discussed with Radcon supervisors. The inspectors assessed the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with licensee procedure SPP-3.1, Corrective Action Program (CAP), Revision (Rev.) 5. Specific documents reviewed are listed in the report Attachment.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment

a. Inspection Scope

Radiation Monitors and Protective Equipment. The inspectors reviewed the operability and maintenance of selected radiation detection and respiratory protective equipment. The inspection consisted of document review, discussions with plant personnel, and observation of routine testing for the following items: Area Radiation Monitors (ARMs, Continuous Air Monitors (CAMs), personnel monitors, portable detection instruments, and Self-Contained Breathing Apparatus (SCBA).

The inspectors reviewed calibration records for ARMs and CAMs and interviewed Health Physics (HP) instrument technicians regarding the results. Whole Body Counter (WBC) calibration records and daily source check trends were reviewed and discussed with a dosimetry technician and supervisor.

Procedural guidance for the use and calibration of portable survey instruments was evaluated. The inspectors observed the daily source check records of survey meters and compared the results to specified tolerances. The inspectors interviewed a HP supervisor regarding the licensee's program for the use of electronic dosimeters (including use in high noise areas) and observed workers log-in and log-out alarming dosimeters.

The licensee's respiratory protection program guidance and its implementation for SCBA use were evaluated and discussed with plant personnel. The number of available SCBA units and their general material and operating condition were observed during tours of the Control Room and Reactor Building and review of monthly inventory check list records. Current records associated with supplied air quality for staged SCBA equipment were evaluated. In addition, control room operators were interviewed to determine their level of knowledge of available SCBA equipment storage locations, and availability of prescription lens inserts, if required. Procedures and training for performing an SCBA bottle changeout were also reviewed.

Program guidance, performance activities, and equipment material condition were reviewed against details documented in 10 CFR Parts 20 and 50; Final Safety Analysis Report (FSAR) Section 7.13, Area Monitoring; applicable sections of NUREG-0737, Clarification of Three Mile Island (TMI) Action Plan Requirements, November 1980; RG 1.97, Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident, Revision 3; and RG 8.15, Acceptable Programs for Respiratory Protection, Revision 1. Licensee procedures and activities related to SCBA were evaluated for consistency with TS and 10 CFR 20.1703. The licensee's instrumentation and protective equipment related procedures, reports and records reviewed during the inspection are listed in the report Attachment.

Problem Identification and Resolution. Selected PERs associated with area radiation monitoring equipment, portable radiation detection instrumentation, and respiratory protective program activities were reviewed and assessed. The inspectors assessed the licensee's ability to characterize, prioritize, and resolve the identified issues in accordance with licensee procedure SPP-3.1, Corrective Action Program (CAP), Revision 5.

b. Findings

Introduction: An NRC-identified, Green, non-cited violation (NCV) was identified for failure to ensure that ARMs were periodically calibrated for the radiation measured as required in 10 CFR Part 20.1501 (b).

Description: While performing the calibration of the ARMs for U2 and U3, the licensee identified an adverse trend of out-of-calibration radiation elements, for the period of January 5, 2001, through July 14, 2003. The U2 calibrations had been previously completed on February 17, 2001, and those of U3 were completed January 5, 2001.

Prior to the 2001 calibration, the ARM's were calibrated on an 18-month frequency. The rate of out-of-calibration ARMs during this time period did not show any adverse trends. Examination of the calibration data sheets for the calibrations performed for U2 on October 14, 1996, and U3 on September 9, 1996, on this frequency did not identify as-found out-of-calibration radiation detection elements.

A review of the 1997 Preventative Maintenance Program records showed that the frequency of ARM calibration was revised from approximately an 18-month interval to 240 weeks (60 months). The change was justified using a manufacturer's recommendation for a recorder used as part of the system. However, this recommendation by the manufacturer did not include the radiation detection elements.

A PER, 03-017835-000, dated September 17, 2003, had been opened by the licensee to evaluate if an adverse trend existed for the out-of-calibration ARM radiation detection elements. The PER stated that, because all of the ARMs are classified as quality-related, the licensee did not consider the calibration problems to be an adverse trend. Two action items were identified in the PER for follow-up with due dates of February 20 and 27, 2004, respectively. However, at the time of the inspection, the inspectors could not find evidence that would support licensee resolution of the issue or the associated action items by the scheduled closure dates. One of the actions involved determining whether the calibration unit was functioning properly. This item was evaluated during the onsite inspection, and no discernable problem was identified with the unit. It was not apparent that the licensee had gone back and reviewed the viability of the 240-week calibration frequency. Based on discussions with the inspectors regarding the data, the licensee had determined an approximate 7.5% out-of-calibration failure rate. In reviewing the data associated with the PER and selected calibration data, the inspector found that 12 of 81 (14.5%) setpoints for U3 were out of calibration. The as-found data for these set points were generally found to be in error in the conservative direction, but were as much as 55% above the calibration limits. The licensee subsequently revised the PER to incorporate this data and advised the inspectors that it would be taken to the Management Review Committee (MRC) for an upgrade to a B level PER, which requires a root cause determination.

Analysis: The inspectors determined that the licensee's failure to ensure that ARMs were calibrated at an appropriate periodicity for the radiation measured as required in 10 CFR Part 20.1501(b) was a performance deficiency. This finding is greater than minor because it is associated with the Occupational Radiation Safety Cornerstone and out of calibration ARMs adversely affects the cornerstone objective attribute to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material. The finding is of very low safety significance because there are other instruments and means to identify degraded operations involving a radioactive material release, and no known operational event occurred during this period.

The finding was evaluated using the Occupational Radiation Safety Significance Determination Process (SDP) and was determined to be a finding of very low safety significance. The finding did not involve ALARA Planning or work controls; an overexposure, or a substantial potential for overexposure; and the licensee's overall ability to assess dose was not compromised.

Enforcement: 10 CFR Part 20.1501 (b) states, "The licensee shall ensure that instruments and equipment used for quantitative radiation measurements (e.g., dose rate and effluent monitoring) are calibrated periodically for the radiation measured." Contrary to the above, during the period January 5, 2001, through July 14, 2003, the licensee failed to ensure that instruments (i.e., ARMs) used for quantitative radiation measurements were calibrated periodically to be adequate for the radiation measured. Because the failure to ensure that the instruments (ARMs) were periodically calibrated is of very low safety significance and has been entered into the licensee's corrective action program (PER 03-017835-000), this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000260, 05000296/2004002-01, Failure to Ensure That ARMs Are Periodically Calibrated.

Cornerstone: Public Radiation Safety (PS)

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

a. Inspection Scope

Radioactive Effluent Treatment and Monitoring Systems. The operability, availability, and reliability of selected effluent process sampling and detection equipment were reviewed and evaluated. Inspection activities included record reviews and direct observation of equipment installation and operation. Current calibration data were reviewed for the selected process monitors.

The inspectors reviewed the most current Radioactive Effluent Report to assess report content and program implementation for consistency with TS and Offsite Dose Calculation Manual (ODCM) requirements. Changes to the current ODCM were also evaluated.

The accessible major components of the gaseous and liquid effluent processing and release systems were observed for material condition and for system configuration with respect to descriptions in the FSAR and ODCM. Material condition, operability, and alarm set points were assessed for six effluent radiation monitoring systems. The inspectors assessed whether compensatory sampling and analyses were performed as required for three effluent radiation monitors which had been declared inoperable at various times during calendar year 2003. Calibration records for four effluent radiation monitors and one count room gamma spectroscopic instrument were reviewed to assess whether required surveillances were current and whether procedurally established acceptance criteria were met. The selected process monitors were associated with liquid radwaste, residual heat removal (RHR) cooling water, main stack, and reactor building vent exhaust. The inspectors reviewed the licensee's quality control (QC) evaluations of

interlaboratory comparison analytical results for samples typical of plant effluents. The inspectors observed sample collection and analysis of the U2 Post-Treatment Off Gas and assessed those activities for procedure adherence.

Equipment configuration, material condition, and operation for the effluent processing, sampling, and monitoring equipment were reviewed against details documented in TS; 10 CFR Part 20; UFSAR Section 9; ODCM, Rev. 15; American Nuclear Standards Institute (ANSI)-N13.1-1969, Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities; ANSI-N13.10-1974, Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactivity in Effluents; and approved procedures listed in the Attachment.

Effluent sampling task evolutions, and offsite dose results were evaluated against 10 CFR Part 20 requirements, Appendix I to 10 CFR Part 50 design criteria, UFSAR details, TS and ODCM requirements, and applicable procedures listed in the Attachment. Laboratory QC activities were evaluated against RG 1.21, Measuring, Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials In Liquid and Gaseous Effluents from Light-Water Cooled Nuclear Power Plant, June 1974; and RG 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment, December 1977.

Problem Identification and Resolution. Five PERs and one audit associated with effluent processing and monitoring activities were reviewed and discussed with Chemistry personnel. The inspectors assessed the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with licensee procedure SPP-3.1, CAP, Rev. 5. Specific documents reviewed are listed in the Attachment.

b. Findings

Introduction: An Unresolved Item (URI) was identified regarding the adequacy of Reactor Building gaseous effluent sampling as prescribed in ANSI N13.1-1969, Guide to Sampling Radioactive Materials In Nuclear Facilities.

Description: The inlet sample lines to the Reactor Building Vent Effluent Radiation Monitors (1,2, & 3-RM-90- 250) were observed by the inspectors to have 90 degree bends rather than bends with radii that are five times the diameter of the sample line as specified in ANSI N13.1-1969. The adequacy of the sampling system was assessed by Battelle Pacific Northwest Laboratories during 1991 and the results of that assessment were documented as an attachment to NRC Inspection Report 50-259, 260, 296/92-10. Battelle's report stated that the air sample transport tubes "would appear to be adequate if one accepts the licensee's position that particle sizes under sampler operation conditions will remain no larger than a couple of microns". At the time of the inspection, the licensee was unable to demonstrate that the particle size of Reactor Building gaseous effluents meets the criteria used in the basis for the Battelle assessment.

Analysis/Enforcement: TS 5.5 required the licensee to establish, implement and maintain the ODCM. Section 5.5 of the ODCM specifies that Quality Assurance procedures shall be established, implemented and maintained for effluent and environmental monitoring, using the guidance in RG 1.21, Rev. 1, June 1974. Section C.6 of RG 1.21 states, "The general principles for obtaining valid samples of airborne radioactive material, the methods and materials for gas and particle sampling, and the guides for sampling from ducts and stacks contained in ANSI N13.1-1969 are generally acceptable and provide adequate bases for the design and conduct of monitoring programs for airborne effluents." Section 4.2.2.1 of ANSI N13.1-1969 states, "A sample obtained with a delivery line and collector which do not discriminate between particles of various sizes can be evaluated accurately as to radiological significance only after knowledge of the physical and chemical properties of the airborne material is obtained. Separate study may be necessary to establish, in given circumstances, the size distribution and chemical nature of the airborne material. Changes in the nature of airborne materials must be anticipated with changes in operations. Characterization of the airborne constituents must be performed frequently enough to assure statistically significant information of the nature of the airborne material." The adequacy of Reactor Building gaseous effluent sampling is deemed to be an Unresolved Item pending demonstration by the licensee that the particle size of the gaseous effluents meets the criteria used in the basis for the Battelle assessment: URI 05000260, 05000296/2004002-02, Licensee Demonstration of Adequacy of Reactor Building Gaseous Effluent Sampling.

2PS3 Radiological Environmental Monitoring Program (REMP) and Radioactive Material Control Program

a. Inspection Scope

REMP Implementation: The environmental monitoring program was assessed by direct physical observation, documentation review, and interviews with licensee personnel.

During the inspection, changes to the Browns Ferry ODCM and FSAR were discussed. In addition, data documented in the Annual Environmental Operating Report for 2001 and 2002 were reviewed in detail.

The inspectors observed the routine collection of eight weekly airborne particulate and iodine samples. The observed sample collection locations were LM-1, LM-2, LM-3, LM-4, LM-6, LM-7, RM-1, and PM-3, the latter of which was at the nearest population center. The inspectors observed the material condition of three river water composite samplers. Immediately downstream water sampler (TRM 293.5), upstream water sampler (TRM 306.0), and the first downstream potable surface water supply (TRM 286.5) were observed. Environmental thermoluminescent dosimeter (TLD) equipment in the immediate vicinity of the air sampling stations were also evaluated for material condition and appropriate location. Air flow calibration records were reviewed for sampler numbers LM-3 , LM-4, and LM-1. Using NRC global positioning system equipment, the licensee's REMP monitoring locations were assessed against ODCM-specified descriptors.

The inspectors also reviewed the procedures from the Western Area Radiological Laboratory (WARL), which analyzes the licensee's environmental samples. During this review, the operation of the laboratory was assessed to determined the adequacy of practices, procedures, and analytic capabilities.

Licensee procedures and activities related to the REMP were evaluated for consistency with TS and ODCM details. Licensee REMP-related procedures, reports, and records reviewed during the inspection are listed in the Attachment.

Meteorological Monitoring Program: The inspectors observed the physical condition of the meteorological monitoring program equipment and supporting instrumentation. The inspectors compared system-generated data for various locations to the data provided by the plant computer. The data were also compared with the inspectors' observations of wind direction and speed. The inspectors assessed system reliability and data recovery. Meteorological tower siting was evaluated for near-field obstructions, ground cover, proximity to the plant, and distance from terrain that could affect the representativeness of the measurements. The inspectors reviewed the calibration data for selected meteorological tower sensors used during the previous year.

Licensee procedures and activities related to meteorological monitoring were evaluated for consistency with TS; ODCM; FSAR Section 2.3, Meteorology; and ANS/ANSI 3.11-2000, Determining Meteorological Information at Nuclear Facilities. Licensee meteorological monitoring related procedures, reports and records reviewed during the inspection are listed in the Attachment.

Unrestricted Release of Materials from the Radiologically Controlled Area (RCA): Radiation protection program activities associated with the unconditional release of materials from the RCA were reviewed and evaluated. The inspectors directly observed surveys of potentially contaminated materials released from the RCA using the Small Article Monitor (SAM)-11 equipment and the release of personnel using the Personnel Contamination Monitors (PCM-1). To evaluate the appropriateness and accuracy of release survey instrumentation, radionuclides identified within recent waste stream analyses were compared against current calibration and performance check source radionuclide types. Current calibration and performance check data were reviewed and discussed. In addition, licensee guidance to evaluate survey requirements for hard-to-detect radionuclides were reviewed and discussed.

The licensee's practices for monitoring for unconditional release of materials from the RCA were evaluated against 10 CFR Part 20 and applicable licensee procedures.

Problem Identification and Resolution: The inspectors reviewed licensee PERs for environmental monitoring and release of radioactive material which are listed in Section 2PS3 of the report Attachment. The inspectors assessed the licensee's ability to characterize, prioritize, and resolve the identified issues in accordance with licensee procedure CAP, SPP-3.1, Revision 5.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Cornerstone: Mitigating Systems

a. Inspection Scope

The inspectors reviewed the licensee's procedures and methods for compiling and reporting PIs, including Procedure SPP-3.4, Performance Indicator for NRC Reactor Oversight Process, for Compiling and Reporting PI's to the NRC. The inspectors reviewed raw PI data for the PI's listed below for the first quarter 2003 through the fourth quarter 2003. The inspectors compared graphical representations, from the most recent PI report to the raw data to verify that the data was correctly reflected in the report. The inspectors reviewed licensee procedure SPP 6.6, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting - 10 CFR 50.65; category A and B PERs; engineering evaluations and associated PERs; and licensee records to verify that the PI data was appropriately captured for inclusion into the PI report, and that the PI was calculated correctly. The inspectors reviewed Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 2, to verify that industry reporting guidelines were applied.

- Unit 2 and Unit 3 Safety System Unavailability: Residual Heat Removal Systems
- Unit 2 and Unit 3 Safety System Unavailability: Emergency AC Power Systems

b. Findings

No findings of significance were identified.

.2 Cornerstone: Occupational Radiation Safety

a. Inspection Scope

The inspectors sampled licensee submittals for the PI indicated below for the period from February 2003 through January 2004. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 2, were used to verify the basis in reporting for each data element. The inspectors reviewed PER records generated from February 2003 through January 2004 to ensure that radiological occurences were properly classified per NEI 99-02 guidance. The inspectors also reviewed electronic dosimeter alarm logs, radioactive material intake records, and monthly PI reports for calendar year 2003. In addition, licensee procedural guidance for classifying and reporting PI events was evaluated. Reviewed documents are listed in the Attachment.

- Occupational Exposure Control Effectiveness

b. Findings

No findings of significance were identified.

.3 Cornerstone: Public Radiation Safety

a. Inspection Scope

The inspectors sampled licensee submittals for the PI indicated below for the period from February 2003 through January 2004. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 2, were used to verify the basis in reporting for each data element. The inspectors reviewed records used by the licensee to identify occurrences of quarterly doses from liquid and gaseous effluents in excess of the values specified in NEI 99-02 guidance. Those records included monthly effluent dose calculations for calendar year 2003. The inspectors also interviewed licensee personnel that were responsible for collecting and reporting the PI data. In addition, licensee procedural guidance for classifying and reporting PI events was evaluated. Reviewed documents are listed in the Attachment.

- RETS/ODCM Radiological Effluents Occurrence

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On April 9, the resident inspectors presented the inspection results to Mr. Ashok Bhatnagar and other members of his staff, who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

.2 Annual Assessment Meeting Summary

On April 20, 2004, the NRC's Chief of Reactor Project's Branch 6 and the Senior Resident Inspector assigned to the Browns Ferry Nuclear Power (BFNP) plant met with the Tennessee Valley Authority (TVA) to discuss the NRC's Reactor Oversight Process (ROP) and the Browns Ferry annual assessment of safety performance for the period of January 1, 2003, through December 31, 2003. The major topics addressed were: the NRC's assessment program, the results of the Browns Ferry assessment, and planned NRC inspection activities. Attendees included Browns Ferry site management and staff, corporate staff, local public officials, and members of the local news media.

This meeting was open to the public. The presentation material used for the discussion is available from the NRC' s document system (ADAMS) as accession number ML041100584. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

4OA7 Licensee-Identified Violations

The following findings of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as NCVs:

- Facility Operating License DRP-68, Docket No. 50-296, (Unit 3), Section 2,C,1, Maximum Power Level, states, in part, that the licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 3458 megawatts thermal. Contrary to the above, between December 2, 2003 and January 27, 2004, there were approximately 310 instances where the eight-hour average steady-state power exceeded 3458 megawatts thermal to a maximum of approximately 3468 megawatts thermal. This was due to a small leak on a feedwater flow instrument that resulted in an inaccurate feedwater flow input into the thermal power calculation. This finding was identified in the licensee's corrective action program as PER 04-000553-000. This finding is of very low safety significance because all core thermal power monitoring systems that monitor and initiate automatic actions for thermal power transients were operable and none of the Technical Specification core thermal power limits were exceeded.

- Unit 3 Technical Specification Section 5.7.2, High Radiation Areas with Dose Rates Greater that 1.0 rem/hour at 30 Centimeters from the Radiation Source or from any Surface Penetrated by the Radiation, but less that 500 rads/hour at One Meter from the Radiation Source or from any Surface Penetrated by the Radiation, states, in part, that each entryway to such an area shall be conspicuously posted as a high radiation area and shall be provided with a locked or continuously guarded door or gate that prevents unauthorized entry and doors and gates shall remain locked except during periods of personnel or equipment entry or exit. Contrary to the above, on March 21, 2004, the entrance to the Unit 3, under condenser area, a high radiation area with a radiation dose rate of approximately 75 rem in one hour at 30 centimeters from the surface, was not controlled by a locked or continuously guarded door or gate. This condition existed for approximately 24 hours. This finding was identified in the licensee's corrective action program as PER 04-002657-000. This finding is of very low safety significance because of the short duration that the area was unlocked and the access to the unlocked high radiation area was within a different boundary being controlled for a contaminated high radiation condition. There was no evidence that any personnel had entered the unlocked high radiation area.

- Unit 2 Technical Specification 5.4, Procedures, Paragraph 1a states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33 Section 9, Procedures for Performing Maintenance, states, in part, that maintenance that can affect the performance of safety-related equipment should be properly pre-planned and performed in accordance with written procedures. Contrary to the above, on February 20, 2004, a maintenance activity to add oil to the Unit 1 and 2 Emergency Diesel Generator B was not conducted in accordance with written instructions. As a result of this performance deficiency, incorrect oil was add to the emergency diesel generator. The emergency diesel generator was required to be removed from service for approximately 24 hours to correct the deficiency. This finding was identified in the licensee's corrective action program as PER 04-001560-000. This finding is of very low safety significance because of the short duration that the emergency diesel generator was removed from service and the three remaining emergency diesel generators, and associated breakers and boards were all available to response to an emergency situation.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION
PARTIAL LIST OF PERSONS CONTACTED

Licensee

T. Abney, Nuclear Site Licensing & Industry Affairs Manager
A. Bhatnagar, Site Vice President
L. Clardy, Site Nuclear Assurance Manager
T. Feltman, Emergency Preparedness Supervisor
R. Jones, Unit 1 Restart Manager
K. Kruger, Assistant Nuclear Plant Manager
J. Lewis, Nuclear Plant Operations Manager
B Marks, Engineering & Site Support Manager
B. Mitchell, Radiation Protection Manager
C. Ottenfeld, Chemistry Manager
J. Ogle, Site Security
P. Olsen, Maintenance & Modifications Manager
M. Skaggs, Nuclear Plant Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000260, 05000296/2004002-01	NCV	Failure to Ensure That ARMs Are Periodically Calibrated. (Section 2OS3)

Opened

05000260, 05000296/2004002-02	URI	Licensee Demonstration of Adequacy of Reactor Building Gaseous Effluent Sampling. (Section 2PS1)

Closed

None

Discussed

None

LIST OF DOCUMENTS REVIEWED

Sections 1R02: Evaluations of Changes, Tests, or Experiments and 1R17: Permanent Plant Modifications

- Document Change Notice (DCN), Engineering Document Change (EDC), Engineering Equivalency Change (EEC), Commercial Grade Dedication (CGD), Temporary Alteration Control Form (TACF) & and Work Orders (WO).

Safety Evaluations

- EDC-51583, Permali Shielding Effects on EQ Equipment When Removed, Rev. A
- EDC-51557A, Alternate Configuration for RHRSW 2-FCV-023-0040 RHR Heat Exchanger Outlet Valve, Rev. 1
- DCN-51312, Replace Recirc. MG Sets, 3A & 3B, with Robicon Variable Frequency Drives (VFD), Rev. A
- DCN-50869, Issue Remainder of Design Change to Replace MG Sets 2A & 2B with Robicon VFDs (Unit 2), Rev. A
- DCN-50287, HPCI Valve Replacements on the Inboard and Outboard Isolation Gate Valves, Rev. A
- DCN-50843, Installation of Main Steam Vault Exhaust Duct Booster Fan for Unit 2, Rev. A
- DCN-51017A, Residual Heat Removal Pump Start Logic Changes
- FSAR 4.10.3.3 & TRM 3.3.10 Drywell Equipment Drain Sump Timers Not Able to Perform FSAR Function at High Temperatures in Sump.
- TACF 2-03-001-082A1, Removal of the Oscillation Power Range Monitor
- 0-GOI-100-3C, Attachment 8, Bypassing Refueling Interlocks, Rev. 45

Screened Out Safety Evaluations

- EDC-51714, Generic Replacement Valves for Obsolete Small-Bore Hancock Valves, Rev. A
- EEC-50067, Design, Purchase, & Installation of Travel Stop for 2/3-TCV-035-0054 Valves, Rev. A
- EEC-50327, Revise Setpoint to Assure Technical Specification Limit Not Exceeded, Rev. A
- DCN-50870, Relocate Temperature Elements in Main Steam Vault, Rev. A
- DCN-51360, Replacement of Circ. Water System Vacuum Breaker (Anti-Siphoning Valves), Rev. A
- DCN-51246A, Removal and/or Replacement of Recirculation System Drain Valves, Rev. 2
- EDC-51371, Removal of HPCI Steam Trap Piston, Rev. A
- DCN-50830, Addition of Drop Leg/Sediment Trap to PSC Head Tank RHR “Keep-Fill” Lines, Rev. A
- DCN-60013A, Replace the Existing 3-D Monitoring Equipment
- DCN-51505A, SLC Transmitter Changed from a GEMAC 555 to a Rosemount 1151
- DCN-51727, Revise the relay set point for the Control Air Compressor ’G’.
- DCN-51380A, Replace a total of four obsolete relays on the Reactor Core Isolation Cooling System

- Commercial Grade Dedication (CGD) CGQ018R, SPX 18-Inch Check Valve Replacement, Rev. 2
- CGD CBP320K, ALCO Controls Thermostatic Control Valve Replacement, Rev. 6
- WO-02-06744, Inspect/Repair U2 HP Feedwater Heater Stiffeners
- WO-01-08353, Seal Oil Vacuum Pump Replacement

PERs

- 03-000559, Calculation Errors for Main Steam Pipe Sizing
- 03-013127, Failure to Follow Design Change Review Requirements
- 03-017205, Errors in T-Pipe Computer Program Analysis
- 02-009094, 10 CFR 50.59 Documentation errors.
- 03-023065, Inadequate 50.59s.

Procedures

- SPP-9.4, 10 CFR 50.59 Evaluation of Changes, Tests and Experiments, Rev. 5
- SPP-9.3, Plant Modifications and Engineering Change Control, Rev. 9

Program and Self Assessment Documents

- SSA-0204, 2/14/03, Engineering Functional Area Audit

Section 1R04: Partial and Complete Equipment Alignment

- Procedure 3-OI-57, Switchyard and 4160 V AC Electrical System
- Procedure 1-OI-85, Control Rod Drive System, Attachment 2, Panel Lineup Checklist and Attachment 3, Electrical System Lineup Checklist
- Procedure 2/3-OI-57, Units 2 and 3 Switchyard and 4160 V AC Electrical System, Attachment 2,
- Switchyard and 4160 V AC Electrical System Panel Checklist
- Procedure 2-OI-71, Reactor Core Isolation Cooling System, Attachment 1, RCIC System Valve
- Lineup Checklist, Attachment 2, RCIC System Panel Lineup Checklist, Attachment 3, RCIC System Electrical Lineup Checklist, and Plant drawing 2-47E813-1, Flow Diagram Reactor Core Isolation Cooling System

Section 1R05: Fire Protection Walkdown and Drill Observation

- Fire Hazards Analysis, Volume 1 and 2
- Fire Pre-Plans: RX3-565, RX3-519SE, RX3-621, RX3-639, RX1-621, RX2-621, RX3-593
- DG3-583
- Smoke Detector Locations: Procedure 0-SI-4.11.A.1(3)b

Section 1R06: Flood Protection Measures

Procedures Reviewed:

- Procedure 0-AOI-100-3, Revision 25, Flood Above Elevation 558'
- Mechanical Preventive Instruction (MPI)-0-260-DRS001, Revision 29, Inspection and Maintenance of Doors
- MPI-0-000-INS001, Revision 8, Inspection of Flood Protection Devices
- Surveillance Procedure 1-SR-2(DF), Revision 14, Instrument Checks and Observations
- Modification and Addition Instruction (MAI)-3.4B, Revision 6, Installation of Flood and Moisture Intrusion Seals

Corrective Action Program Documents Reviewed:

- Operations Self-Assessment No. BFN-OPS-04-002, Flood Protection Program

PERs/WOs

- 2002-002019-003, Replace Sump Pump in Manhole in Switchyard West End
- 2003-005178-000, Remove Temporary Wood Support Framing Installed at the Northwest End of the Switchyard Tunnel
- 2003-005186-000, Sump Pump in West End of Switchyard Tunnel Not Working
- 2003-007722-000, Inspect Flood Gate
- 2003-008481-000, Review of Cable Installations Potentially Susceptible to Stress due to Long-Term Submergence in Water
- 2003-015003-000, The Switchyard Drainage Channel Has Become Overgrown with Weeds, Brush, and Trees
- 2003-015486-000, Perform Inspection, Cleaning, and Preventive Maintenance Necessary to Maintain Sump in Manhole
- 2003-016028-000, The Sump Pump Located at the “Tee” of the Switchyard Tunnel Will Not Run
- 2003-016455-000, Install New Sump in Switchyard Cable Tunnel
- 2003-023048-000, Troubleshoot and Repair Sump Pump in Switchyard Cable Tunnel

Section 1R08 Inservice Inspection (ISI)

Procedures

- NDE Procedure, N-MT-6, Magnetic Particle Examination for ASME and ASNI Code Components and Welds, Rev. 25
- NDE Procedure, N-PT-9, Liquid Penetrant Examination of ASME and ANSI Code Components and Welds, Rev. 25
- NDE Procedure, N-UT-78, PDI Generic Procedure for the Manual Ultrasonic Examination of Reactor Vessel Welds, Rev. 2

- NDE Procedure, N-UT-76, PDI Generic Procedure for the Ultrasonic Examination of Ferritic Piping Welds, Rev. 4
- Framatone ANP NDE Procedure 54-ISI-850-03, Manual Ultrasonic Examination of BWR Reactor Vessel Nozzle Inner Radius Regions and Nozzle to Shell Welds (Inner 15%), dated April 15, 2003
- Technical Instruction, 0-TI-363, ASME Section XI Repair and Replacement, Rev. 5
- Technical Instruction, 0-TI-365, Reactor Pressure Vessel Internals Inspection, Units 1, 2 and 3, Rev. 10
- TVA Standard, SPP-9.1, ASME Section XI, Rev. 4
- TVA Standard, SPP-9.7, Corrosion Control Program, Rev 4

Other Documents

- Problem Evaluation Report (PER) 04-002200-000, Missing article in Unit 3 RVP from dryer support bracket
- PER 04-002266-000, Failed bolts on main steam pipe support 3-47B00-204
- PER 04-002305-000, During RPV internals inspection Jet Pump 20 inlet mixer wedge found off center relative to restrainer bracket pad
- PER 04-002403-000, TVA NDE level III identified that vendor had performed RVP VIP VT exams on incorrect weld on jet pump #11
- PER 04-002720-000, Inadequate size fillet weld on HDV-3-001-009
- GE Report DRF 0000-0027-1640, Review of RF011 Jet Pump Inspection Results - Browns Ferry Unit 3, March 19, 2004

Section 1R12: Maintenance Effectiveness

Procedures:

0-TI-346, Rev 16, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting
SPP-6.6, Rev 5, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting

Section 1R17: Permanent Plant Modifications

See Section 1R02 for list of documents reviewed.

Section 1R20.1: Refueling and Outage Activities

Procedures/Surveillace

- 3-AOI-100-1, Reactor Scram
- 3-OI-68, Reactor Recirculation System
- 3-SR-3.6.1.3.5, Valves Cycled During Cold Shutdown
- 3-SI-3.2.12, Verification of Fail-Safe Position For MSIVs
- 3-GOI-200-2, Drywell Closeout
- 0-GOI-3B, Spent Fuel Pool Verification
- 0-GOI-100-3C, Fuel Movement Operations While Refueling
- Local Leak Rate Testing (LLRT)/Torus Inspections
- 3-SI-4.7.A.2.g-3/3a Primary Containment LLRT Reactor Feedwater Line A: Penetration X-9A

- 3-SI-4.7.A.2.g-3/74e Primary Containment LLRT RHR Suppression Pool Spray: Penetration X-211B
- WO 03-016937-000, Multiple torus inspection reports and coating repair documents

Clearances Reviewed/Walked Down

- Tagout: 3-TO-2004-001
- Sections: 3-211-0001, 4-kV Shutdown Board 3EA
- 3-074-0018, Residual Heat Removal Pump 3A
- 3-082-0023, Emergency Diesel Generator 3EA
- 3-211-0002, 4-kV Shutdown Board 3EC and Emergency Diesel Generator 3EC
- 3-075-0004, Unit 3 Core Spray System Loop II
- 3-211-0002, 4-kV Shutdown Board 3ED and Emergency Diesel Generator 3ED

Section 2OS1: Access Controls to Radiologically Significant Areas

Procedures, Guidance Documents, and Manuals

- PP-5.1, Radiological Controls, Revision (Rev.) 5
- RCI-1.1, FO-IP-9, Radiation and Contamination Surveys, Rev. 0109
- RCI-1.1, FO-IP-10, Airborne Radioactivity Surveys, Rev. 0109
- RCI-9.1, Radiation Work Permit Preparation and Administration, Rev. 39
- RCI-17, Control of High Radiation Areas and Very High Radiation Areas, Rev. 45
- 0-GOI-100-3B, Operations in Spent Fuel Storage Pool Only, Rev. 21
- SPP-3.1, Corrective Action Program, Rev. 5

Records and Data

- RWP No. 04334212, Routine Plant Maintenance- Cleanout of CRD Rebuild Room, Rev. 0
- RWP No. 04334214, Routine Plant Maintenance- Support for Cleanout of CRD Rebuild Room, Rev. 0
- Radiological Survey No. 04-10110, U2 Turbine Building El. 586 to 634, 01/22/04
- Radiological Survey No. 020304-13, Unit 2 RXB 621 CRD Rebuild, 02/03/04
- Radiological Survey No. 020304-8, Radwaste 546' General Area, 02/03/04
- Radiological Survey No. 062703-9, 3RXB664-RFF Dryer Assembly-Underwater Survey, 06/27/03
- Radiological Incident Reports involving skin dose assessment, January 2003 - December 2003
- LHRA key control logs, 1/29/04 - 02/05/04
- Extremity badge dose record, 06/29/03

Corrective Action Program (CAP) Documents

- Nuclear Assurance - TVAN-Wide - Audit Report No. SSA0302, Radiological Protection and Control Audit, 12/31/03
- Problem Evaluation Report (PER) 04-000914-000, A bucket of fuel brushes suspended in the U3 Spent Fuel Pool was found without a Radcon tag affixed to the lanyard, 02/04/04
- PER 03-014406-000, Trending PER - Rate of occurrence of personnel entering HRAs on the wrong RWP has increased, 08/01/03
- PER 03-015957-000, HRA sign removed then not properly re-posted, 08/19/03

Section 2OS3: Radiation Monitoring Instrumentation and Protective Equipment

Reports, Procedures, Instructions, Lesson Plans, and Manuals

- Browns Ferry Nuclear Plant FSAR Section 7 (Plant Area Monitors)
- Browns Ferry Nuclear Plant Operations Weekly Schedule, Week of February 2, 2004
- Component Calibration Instruction, CCI-0-RE-00-117, Eberline Rm-14 Portable Radiation Ratemeters, Rev. 3A
- Component Calibration Instruction, CCI-0-RE-00-238: Eberline Instrument Corporation PCM-2 Personnel Contamination Monitor, Rev. 2
- Component Calibration Instruction, CCI-0-RM-90-150, Eberline Air Particulate Cam Source Calibration with Control Room Communications Interface, Rev. 15
- Component Calibration Instruction, CCI-0-RE-00-237, Eberline Instrument Corporation PCM-1B Personnel Contamination Monitor, Rev. 16
- Bicron-NE -Small Article Monitor (SAM-11) Calibration, Response Check and Operating Procedure, Revision 51
- Special Instrument Instruction, SII-0-XX-00-271, AMS-3 Beta Air Monitor Calibration, Rev. 3
- System Instrument Instruction, SII-0-XX-00-300, PM-7 Portal Monitor, Rev. 2
- Calibration Procedure for the MG DMC-90, 100 and 2000, LSCP-0078, Rev. R11
- Determination of Respiratory Protection Requirements, Procedure RCI-1.1, Rev. 0109
- Respiratory Protection Program Implementation, Procedure RCI-3.1, Rev. 27
- Lesson Plan: HPT063.002, Self Contained Breathing Apparatus (SCBA) Training

CAP Documents

- Self Assessment Report: BFN-RP-02-003, To evaluate the Effectiveness of the RADCON Instrumentation Program at BFN, September 9-27, 2002
- PER 03-005622, Electronic Dosimeter malfunction, 3/27/03
- PER 03-003951, Electronic Dosimeter alarm investigation, 3/5/03
- PER 03-014406, Increased rate of alarms occurrences for electronic dosimeter associated with workers signing in on wrong RWPs, 8/1/03

Section 2PS1: Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

Procedures, Guidance Documents, and Manuals

- Offsite Dose Calculation Manual, Rev. 15
- 0-SI-4.2.D.1, Liquid Radwaste Monitor Calibration/Functional Test, Rev. 27
- 3-SI-4.2.D-2A, RHR Service Water Radiation Monitor (3-RM-90-133D) Calibration and Functional Test, Rev.14
- 3-SI-4.2.D-3, Raw Cooling Water Radiation Monitor (3-RM-90-132D) Calibration and Functional Test, Rev. 16
- 0-SI-4.2.K.1, Airborne Effluents - Main Stack Monitoring System Calibration, Rev. 27
- 2-SI-4.8B.1.a.3, Off Gas Treatment Release Rate by Manual Sampling, Rev. 10
- CI-406, Pre and Post Treatment Off Gas Sampling, Rev. 5
- CI-303.15, Efficiency Calibration (Gamma-Ray Spectrometry System), Rev. 11
- SPP-3.1, Corrective Action Program, Rev. 5

Records and Data

- 0-RM-90-130 Liquid Radwaste Monitor, Calibration records dated 8/27/03
- 3-RM-90-133 RHR Service Water Monitor, Calibration records dated 12/29/03
- 3-RM-90-132 Raw Cooling Water Monitor, Calibration records dated 8/21/03
- 0-RM-90-147&148 Main Stack Monitors, Calibration records dated 11/15/03
- Gamma Spectroscopic Efficiency Calibration records for Detector No. 1 dated 2/5/03
- Compensatory sampling records of monitors 0-RM-90-147 on 9/12 - 15/03, 1-RM-90-250 on 1/19 - 21/03, and 3-RM-90-132D on 6/25 - 27/03
- Interlaboratory comparison analytical results for first three quarters of 2003
- Monthly liquid effluent dose calculations for June and July 2003
- Monthly gaseous effluent dose calculations for January through December 2003

Annual Reports

- Browns Ferry Nuclear Plant - Units 1, 2, and 3 - Annual Radioactive Effluent Release Report - January through December 2002, dated April 30, 2003

CAP Documents

- Nuclear Assurance - TVAN-Wide - Audit Report No. SSA0302, Radiological Protection and Control Audit, 12/31/03
- PER 03-002938, Abnormal organ dose calculated for 4th Quarter of 2002, 2/20/03
- PER 03-009514, Unplanned entry into a LCO. 3-RM-90-0250 declared inoperable due to failed source check, 5/27/03
- PER 03-013732, 1-RM-90-251 failed source check, 7/23/03
- PER 03-015331, Evaluate replacing Liquid Radwaste Effluent flow rate instrument, 8/13/03
- PER 03-018049, Revise alarm response procedure for 1-RM-90-132 to rectify low flow trip conditions, 9/18/03

Section 2PS3: Radiological Environmental Monitoring Program (REMP) and Radioactive Material Control Program

Procedures, Guidance Documents, and Manuals

- Browns Ferry Nuclear Plant Final Safety Analysis Report, Section 2 (Environmental/Meteorological)
- Browns Ferry Nuclear Plant Offsite Dose Calculation Manual, Rev. 15
- Browns Ferry Nuclear Plant Annual Radiological Environmental Operating Report-2001
- Browns Ferry Nuclear Plant Annual Radiological Environmental Operating Report-2002
- EMSTD-01, Environmental Radiological Monitoring Program, Rev. R21
- G-01, Gross Alpha and gross Beta Activity Determination, Rev. R9
- G-03, Gamma Analysis By Germanium Spectroscopy, Rev. R6
- QC-10, Alpha and Beta Background and Count Reproducibility Checks, Rev. R6
- QC-04, Gamma Efficiency Calibration of Germanium Detectors, Rev. R8
- QC-104, Sample Receiving and Log-In, Rev. R10
- QC-18, Liquid Scintillation Background and Count Reproducibility Check, Rev. R5
- SC-01, Collection of Environmental Monitoring Samples, Rev. R18

- SC-02, Preventive Maintenance for Radiological Environmental Monitoring Air Sampling System, Rev. R3
- C-03, Calibration Procedure for Radiological Environmental Monitoring Air Sampler System Gas Meter, Rev. 4
- T-01, Beta Activity Determination by Liquid Scintillation, Rev. R13
- TLD-0018, Environmental Dosimetry Procedure, Rev. R9
- EPFS-6, Calibration of Environmental Data Station Data Logger and Sonic Channels, Rev. 10

Records and Data

- EPRFS-6 Sonic Wind Direction Calibration Sheet dated 10/21/03
- EPRFS-6 Sonic Wind Direction Calibration Sheet dated 4/21/03
- EPRFS-6 Air Temperature System Calibration Sheet dated 10/21/03
- EPRFS-6 Solar Radiation Data Logger Calibration Sheet dated 10/21/03
- EPRFS-6 Rain Gage and Data Collection Calibration Sheet dated 10/21/03
- EPRFS-6 Rain Gage and Data Collection Calibration Sheet dated 4/21/03
- EPRFS-6 Dew Point System Calibration Sheet dated 5/7/03
- EPRFS-6 Dew Point System Calibration Sheet dated 10/21/03

CAP Documents

- Nuclear Assurance (NA)-TVAN-Wide Audit Report No. SSA0302 - Radiological Protection and Control Audit, December 31, 2003
- PER 03-000068, The Radiological Environmental Monitoring Program air filter and charcoal
- samples could not be collected as scheduled on February 18, 2003 from BFN location LM-7 due to problems with the sampling pump, 2/19/03
- PER 03-000177, During performance of Self-Assessment CRP-ERMI-03-002, documentation could not be found for the training provided to the ERM&I sample personnel, 5/6/03
- PER 03-000178, During the preparation of The Annual Radiological Environmental Operating Report for BFN, it was noted that 75% of the environmental TLD readings from Station N-2 were unavailable due to damaged or lost TLDs, 5/6/03
- PER 03-000186, Total air volume sampled did not meet the minimum required value for the air filter and charcoal cartridge samples scheduled for collection on May 12, 2003 from BFN REMP monitoring location LM-3, 5/13/03
- PER 03-000483, The BFN REMP air filter and charcoal samples scheduled for collection on October 20, 2003 from location PM-3 did not have an adequate total volume, 10/21/03

Section 4OA1: Performance Indicator Verification

Mitigating Systems Cornerstone

Procedures

- SPP-3.4, Performance Indicator for NRC Reactor Oversight Process
- Desktop Guide for Identification and Reporting of NEI 99-02, Performance Indicators for Occupational Exposure Control Effectiveness
- CI-138, Reporting NEI Indicators

Occupational and Public Radiation Safety Cornerstones

Procedures and Records

- SPP-3.4, Performance Indicator and MOR Submittal using INPO Consolidated Data Entry, Rev. 2
- Desktop Guide for Identification and Reporting of NEI 99-02, Rev. 2, Performance Indicators for Occupational Exposure Control Effectiveness.
- Electronic dosimeter alarm logs, calendar year 2003
- Radioactive material intake logs, calendar year 2003
- Monthly PI reports, February, 2003 - January, 2004
- CI-138, Reporting NEI Indicators, Rev. 1
- Monthly liquid effluent dose calculations for June and July 2003
- Monthly gaseous effluent dose calculations for January through December 2003

CAP Documents

- PER 03-014442-000, A technician left site with a LHRA key in his possession, 08/01/03
- PER 03-017477-000, Radcon shift logs for 9/10 and 9/11, 2003 did not contain the required entry for LHRA key accountability, 09/12/03
- PER 03-024736-000, LHRA ladder found unlocked during housekeeping tour, 12/18/03