



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

JUN - 3 1994

[REDACTED]

Dear [REDACTED]

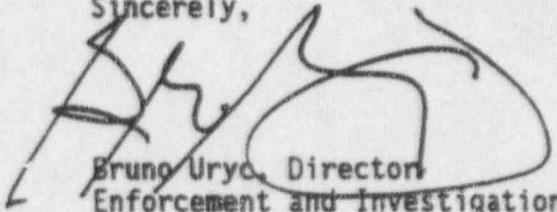
SUBJECT: RII-93-A-0191 - QUESTIONABLE EQUIPMENT AND HEALTH PHYSICS PRACTICES

This refers to our letter dated March 24, 1994, in which we provided you with our review regarding your concerns related to equipment practices and a status of the health physics concern you expressed to the Resident Inspector on September 28, 1993, at the Vogtle Nuclear Plant.

Our review of concern number 5 related to health physics practices has been completed. Our review is documented in the enclosures to this letter. Based on the information provided, we were able to partially substantiate the concern.

This concludes the staff's activities regarding this matter. We appreciate your cooperation and assistance.

Sincerely,


Bruno Uryc, Director
Enforcement and Investigation
Coordination Staff

Enclosures:

1. Concern Summary
2. Inspection Report No.
50-424, 425/94-08

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Enclosure 3

CONCERN NO. 5 SUMMARY

VOGTLE NUCLEAR PLANT

RII-93-A-0191

HEALTH PHYSICS PRACTICES

Concern No. 5.1

The concerned individual (CI) was concerned that Health Physics (HP) would not issue meters to Plant Equipment Operators (PEOs).

Findings

The subject concern was reviewed during an NRC inspection conducted March 28 - April 1, 1994, and documented in Inspection Report (IR) 50-424, 425/94-08 dated April 29, 1994. This report is enclosed, and the subject concern is addressed in general in Paragraph 7.

The inspector reviewed the licensee's policy for issuance of survey instruments. In general, the inspector noted that personnel in Operations, Maintenance, etc. were not issued survey instruments for field use. Typically, only HP personnel were allowed to use survey instruments. Discussions with licensee representatives revealed that personnel other than HP could be issued survey instruments if they had completed specific training (non-required). However, according to the licensee, very few individuals other than HP personnel had completed the training. The licensee maintained a database of qualified instrument users and issued meters via the database.

Conclusions

The concern was substantiated in that, in general, PEOs are not issued survey meters. HP does not arbitrarily issue meters to anyone without specialized training, and few non-HP personnel have completed the specialized training. No violations or deviations were identified.

Concern No. 5.2

The CI was concerned that PEOs were not given escorts in high radiation areas (HRAs).

Findings

The subject concern was reviewed during an NRC inspection conducted March 28 - April 1, 1994, and documented in IR 50-424, 425/94-08 dated April 29, 1994. This report is enclosed, and the subject concern is addressed in general in Paragraph 4.e.

The inspector reviewed the licensee's overall control of HRAs and entrance thereto. Keys were properly controlled and maintained. HP escorts accompanied in certain cases, such as new/rare work, or very

high/transient/unknown dose rates; however, most HRA entries were routine in nature (i.e. Operations verifications), and did not require HP escort. Technical Specification (TS) 6.11.1 allows the licensee to control each entry into a HRA in which the intensity of radiation is greater than 100 millirem/hour at 30 cm (12 in.) by barricading and conspicuously posting, and requiring issuance of an RWP. Any individual or group of individuals permitted to enter such areas must be provided with or accompanied by (1) a survey instrument; (2) a digital alarming dosimeter (DAD) which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received; and/or (3) an individual qualified in radiation protection procedures, with a survey instrument or DAD, who is responsible for providing positive control over the activities within the area. TS 6.11.2 requires additional controls for areas accessible to personnel with radiation levels greater than 1,000 millirem/hour at 30 cm (12 in.), including locked doors, controlled keys, and flashing warning lights. Individuals requesting entry into a HRA were briefed on the appropriate RWP, issued a special HRA DADs, and made knowledgeable of the dose rates in the area. Based on the inspection findings, HRAs were found to be controlled and entered in accordance with 10 CFR Part 20, TS 6.11, and other licensee procedures.

Conclusions

The concern was substantiated in that, in general, PEOs are not given escorts into HRAs. In certain cases, HP escorts do accompany; however, most HRA entries are routine and do not require direct HP surveillance. In these cases, logging onto the proper RWP, possessing and properly using a DAD, and being made knowledgeable of the area dose rates was the practice. No violations or deviations were identified.

Concern No. 5.3

The CI was concerned that surveys of letdown heat exchanger rooms were inadequate in that the HP technician would stick a teletector in the room and say the area was O.K.

Findings

The subject concern was reviewed during an NRC inspection conducted March 28 - April 1, 1994, and documented in IR 50-424, 425/94-08 dated April 29, 1994. This report is enclosed, and the subject concern is addressed in general in Paragraph 6.a.

The inspector reviewed selected records of radiation and contamination surveys performed during 1993 and 1994, including letdown heat exchanger room surveys, and discussed the survey results with licensee representatives. The licensee had made some changes to the routine survey program based on an internal evaluation of the program. Overall, changes were made such that survey frequencies were more commensurate (i.e. ALARA) with the work performed in the area. For example, infrequently entered areas (i.e. letdown heat exchanger rooms) were surveyed on a prior-to-entry basis, and contaminated areas were not entered and surveyed as often unless work was to take place subsequent to the entry. Depending on the work to be performed, the adequacy of the pre-

entry survey could vary greatly. Simply sticking a teletector in the room for a pre-entry survey would suffice for a job such as checking a gauge or turning a valve. Other jobs, such as those requiring climbing, crawling, or long stay times, would require more extensive surveys. The inspector reviewed the evaluation and found it to be well-founded and detailed, and the inspector's review of survey records revealed no concerns or problems.

Conclusions

The concern was not substantiated. No evidence was found that indicated that surveys using a teletector as conducted by the licensee were not adequate and commensurate (i.e. ALARA) with the work involved. No violations or deviations were identified.

Concern No. 5.4

The CI was concerned that surveys of letdown heat exchanger rooms were not performed for months.

Findings

The subject concern was reviewed during an NRC inspection conducted March 28 - April 1, 1994, and documented in IR 50-424, 425/94-08 dated April 29, 1994. This report is enclosed, and the subject concern is addressed in general in Paragraph 6.a.

As indicated in Concern No. 3, surveys of areas such as letdown heat exchanger rooms were performed on an as-needed, prior-to-entry basis. During operation, it appeared possible that rooms such as these would not need to be entered for long periods of time, therefore eliminating the need for room surveys. The inspector noted that HP personnel conducted routine door checks to ensure that they were locked, and in many other HRAs, remote "mini-surveys" were routinely conducted in areas directly outside/around HRAs to verify that dose rates in those more accessible areas had not significantly changed. Significant changes in the "mini-surveys" would prompt HP to conduct more extensive surveys. Based on the inspection findings, the licensee's survey program was found to be in accordance with requirements.

Conclusions

The concern was substantiated in that the potential existed for the period between surveys to be months in areas such as letdown heat exchanger rooms. No violations or deviations were identified.

Concern No. 5.5

The CI was concerned that the HP staff was not dedicated and that the licensee relies on contractors during outages.

Findings

The subject concern was reviewed during an NRC inspection conducted March 28 -

April 1, 1994, and documented in IR 50-424, 425/94-08 dated April 29, 1994. This report is enclosed, and the subject concern is addressed in general in Paragraph 2.

The inspector reviewed the licensee's organization, staffing levels, and lines of authority as they relate to radiation protection. No significant changes were noted. Staffing levels and training were in accordance with the updated Final Safety Analysis Report (FSAR). Some reduction in staffing levels was accomplished through attrition with no observed adverse effects on function or performance in the area of radiological controls. Outages typically required additional available workers (i.e. contract employees) to accomplish all necessary repairs and maintenance; however, over time, the licensee has shortened outages and used fewer contract employees.

Conclusions

The concern was substantiated in that the licensee relies on contractors during outages to accomplish all necessary work. The inspection did not directly address the issue regarding the dedication of HP staff due to its non-regulatory and subjective nature; however, no evidence was found that indicated serious functional or management support problems within the HP organization. No violations or deviations were identified.

FEB 17 1993

Docket Nos. 50-424, 50-425
License Nos. NPF-68, NPF-81

Georgia Power Company
ATTN: Mr. W. G. Hairston, III
Senior Vice President -
Nuclear Operations
P. O. Box 1295
Birmingham, AL 35201

Gentlemen:

SUBJECT: NRC INSPECTION REPORT NOS. 50-424/93-02 AND 50-425/93-02

This refers to the inspection conducted by B. Bonser of this office on January 3, through January 30, 1993. The inspection included a review of activities authorized for your Vogtle facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

Within the scope of the inspection, no violations or deviations were identified.

In accordance with 10 CFR 2.790(a), a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

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

Sincerely,

ORIGINAL SIGNED BY
ALAN R. HERDT

Alan R. Herdt, Chief
Reactor Projects Branch 3
Division of Reactor Projects

Enclosure:
NRC Inspection Report

cc w/encl: (See page 2)

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PDR ADOCK 05000424
G PDR

Enclosure 4

IE01

Georgia Power Company

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FEB 17 1993

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cc: Continued see page 3

FEB 17 1993

Georgia Power Company

3

cc: Continued
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for SSparks
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PSkinner
02/17/93



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA STREET, N.W.
 ATLANTA, GEORGIA 30323

Report Nos.: 50-424/93-02 and 50-425/93-02

Licensee: Georgia Power Company
 P. O. Box 1295
 Birmingham, AL 35201

Docket Nos.: 50-424 and 50-425

License Nos.: NPF-68 and NPF-81

Facility Name: Vogtle 1 and 2

Inspection Conducted: January 3, 1993 - January 30, 1993

Inspector: <u><i>B. R. Bohser</i></u>	<u>2/17/93</u>
for B. R. Bohser, Senior Resident Inspector	Date Signed
<u><i>R. D. Starkey</i></u>	<u>2/17/93</u>
for R. D. Starkey, Resident Inspector	Date Signed
<u><i>P. A. Balmain</i></u>	<u>2/17/93</u>
for P. A. Balmain, Resident Inspector	Date Signed

Accompanied by: J.L. Starefos

Approved by: <u><i>P. Skipper</i></u>	<u>2/17/93</u>
P. Skipper, Chief	Date Signed
Reactor Projects Section 3B	
Division of Reactor Projects	

SUMMARY

Scope: This routine, inspection entailed inspection in the following areas: plant operations, surveillance, maintenance, refueling preparations and follow-up.

Results: No violations or deviations were identified.

A weakness was identified in the control of measuring and test equipment (M&TE) used for pump vibration In-Service Test (IST) surveillances and in the control of software used for initialization of the frequency response range.

The licensee was slow in the repair of diesel generator (DG) room dampers which are a part of the safety related DG Heating Ventilation and Conditioning (HVAC) System. Although the dampers had been failed open in the safe position, the licensee was slow in identifying and correcting the damper problems.

A Part 21 notification on a manufacturing defect in the four-way hydraulic valves used in the main feedwater isolation valves (MFIV) was reviewed. All four-way valves in service at Vogtle were identified as part of the defective lot. Since the Vogtle MFIVs have no present indication of failure and have redundant hydraulic closure trains, it was concluded that this was not an immediate safety concern.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

J. Beasley, Assistant General Manager Plant Operations
S. Bradley, Reactor Engineering Supervisor
*W. Burmeister, Manager Engineering Support
*S. Chesnut, Manager Engineering Technical Support
*C. Christiansen, SAER Supervisor
C. Coursey, Maintenance Superintendent
*R. Dorman, Manager Training and Emergency Preparedness
*G. Frederick, Manager Maintenance
*M. Griffis, Manager Plant Modifications
M. Hobbs, I&C Superintendent
*K. Holmes, Manager Operations
*D. Huyck, Nuclear Security Manager
*W. Kitchens, Assistant General Manager Plant Support
R. LeGrand, Manager Health Physics and Chemistry
G. McCarley, ISEG Supervisor
M. Sheibani, Nuclear Safety and Compliance Supervisor
*W. Shipman, General Manager Nuclear Plant
*C. Stinespring, Manager Administration
*J. Swartzwelder, Manager Outage and Planning
C. Tynan, Nuclear Procedures Supervisor
*T. Webb, Engineer
J. Williams, Supervisor Work Planning and Controls

Other licensee employees contacted included technicians, supervisors, engineers, operators, maintenance personnel, quality control inspectors, and office personnel.

Oglethorpe Power Company Representatives

*T. Mazingo
*C. Mitchell

NRC Resident Inspectors

*B. Bonser
*D. Starkey
*P. Balmain
*J. Starefos

*Attended Exit Interview

An alphabetical list of abbreviations is located in the last paragraph of the inspection report.

2. Plant Operations - (71707)

a. General

The inspection staff reviewed plant operations throughout the reporting period to verify conformance with regulatory requirements, Technical Specifications, and administrative controls. Control logs, shift supervisors' logs, shift relief records, LCO status logs, night orders, standing orders, and clearance logs were routinely reviewed. Discussions were conducted with plant operations, maintenance, chemistry and health physics, engineering support and technical support personnel. Daily plant status meetings were routinely attended.

Activities within the control room were monitored during shifts and shift changes. Actions observed were conducted as required by the licensee's procedures. The complement of licensed personnel on each shift met or exceeded the minimum required by TS. Direct observations were conducted of control room panels, recorder traces and instrumentation important to safety. Operating parameters were observed to verify they were within TS limits. The inspectors also reviewed DCs to determine whether the licensee was appropriately documenting problems and implementing corrective actions.

Plant tours were taken during the reporting period on a routine basis. They included, but were not limited to the turbine building, the auxiliary building, electrical equipment rooms, cable spreading rooms, NSCW towers, DG buildings, AFW buildings, and the low voltage switchyard.

During plant tours housekeeping, security, equipment status and radiation control practices were observed. The inspectors observed a visitor exiting the protected area without following administrative procedures. The incident was brought to the attention of the security manager who investigated the situation and took corrective actions.

The inspectors verified that the licensee's health physics policies/procedures were followed. This included observation of HP practices and review of area surveys, radiation work permits, postings, and instrument calibration.

The inspectors verified that the security organization was properly manned and security personnel were capable of performing their assigned functions; persons and packages were checked prior to entry into the PA; vehicles were properly authorized, searched, and escorted within the PA; persons within the PA displayed photo identification badges; and personnel in vital areas were authorized.

b. Unit 1 Summary

The unit began the period operating at 100% power and operated at full power throughout the inspection period.

c. Unit 2 Summary

The unit began the period operating at 100% power and operated at full power throughout the inspection period.

d. Fire Drill

On January 15 the inspectors observed an announced fire drill. The simulated fire occurred in the Administration Building auditorium. This was the first time that a fire drill scenario required the fire team to exit the protected area to respond to a fire. The fire team dressed out at the TSC fire team equipment room then proceeded to the PA vehicle entry gate to exit the PA en route to the Administration Building. Coordination with Security appeared to go smoothly and no delay was encountered in exiting the PA. Once at the simulated fire location the fire team performed a search and rescue to remove an injured individual from the auditorium and extinguished the simulated fire. The inspectors were satisfied that the drill met its objectives and that the fire team responded appropriately.

The licensee's post drill critique identified one potential problem. The nearest fire hose cabinet outside the Administration Building is located behind the building inside the fenced PA and, therefore, not easily accessible. There are numerous hose cabinets inside the Administration Building but they could be potentially inaccessible during a fire. The licensee is considering several solutions to this problem. The inspectors considered it commendable that those participating in the drill identified this potential problem and that prompt action was initiated to find a solution.

e. Soft Drink Spill in Control Room

On January 25, while touring the Unit 2 Control Room, the inspector observed a fresh stain on the carpeting immediately adjacent to the main control board. The inspector learned that the stain resulted from a soft drink spill that occurred when the cap on a pressurized soft drink bottle came off and the liquid was expelled on the CR ceiling and floor. The liquid in the three liter bottle was under higher than normal pressure.

This incident itself was of minor significance since the liquid did not spray on any control board. The inspector, however, was concerned about the cause and the potential consequences, and brought these concerns to the attention of plant management. The licensee's investigation found that no "horseplay" had been

involved and that the incident was solely due to human error. The licensee, in order to increase awareness of the control of food and drink in the control room and to highlight the potential consequences of this incident, plans to prepare a shift briefing covering this specific incident and other similar industry events. The inspector will observe the licensee's actions associated with this effort.

No violations or deviations were identified.

3. Surveillance Observation (61726)

a. General

Surveillance tests were reviewed by the inspectors to verify procedural and performance adequacy. The completed tests reviewed were examined for necessary test prerequisites, instructions, acceptance criteria, technical content, data collection, independent verification where required, handling of deficiencies noted, and review of completed work. The tests witnessed, in whole or in part, were inspected to determine that approved procedures were available, equipment was calibrated, prerequisites were met, tests were conducted according to procedure, test results were acceptable and systems restoration was completed.

<u>SURVEILLANCE NO.</u>	<u>TITLE</u>
14629-2	SSPS Slave Relay K623 Train B Test Containment Isolation
14803-2	CCW Pumps and Discharge Check Valves Inservice Test
14806-1	Containment Spray Pump and Check Valves Inservice Test
14807-1,2	Motor Driven Auxiliary Feedwater Pump Inservice Test
14808-2	CCP Pump and Check Valve IST and Response Time Test-CCPA
14804-2	Safety Injection Pump Inservice Test

b. Control of Measuring and Test Equipment for Inservice Tests

During this inspection period the licensee began using a CSI vibration measurement system to acquire displacement vibration amplitude data during pump inservice tests. This CSI system is normally used for the predictive maintenance program. The transition to this vibration measuring equipment is being made to

obtain more consistent vibration data for IST trending. Prior to the transition, IST vibration data was taken using IRD vibration monitors. With IRD vibration monitors, raw data was collected on a strip chart and interpreted to obtain a vibration measurement. The CSI monitors collect and uniformly analyze vibration data and provide a numerical result without interpretation.

The inspector observed several pump IST surveillances and observed vibration data being recorded using IRD monitors concurrently with CSI monitors. The vibration data taken with the CSI monitors was for comparison use and was not being used to fulfill IST or TS surveillance requirements. Following evaluation of this data the IRD monitors will be phased out and the CSI monitors will be used for TS surveillance data collection. The inspector also verified that the IST surveillance procedures specifically required the use of an IRD-820 monitor with a 560 velocity pickup, and that the instruments were required to be calibrated to ± 5 percent accuracy as a pair (meeting the accuracy required by ASME Table Code Section XI IWP 4110-1, Acceptable Instrument Accuracy).

On January 14, the inspector was reviewing calibration records for CSI vibration monitor number VP-2-1566 and identified that the sensor pickup on this monitor was not matched with the pickup with which it had been last calibrated. The inspector asked toolroom personnel to retrieve the three other CSI monitors to determine if these were also unmatched. It was determined that three of the four monitors had sensor pickups exchanged. Following identification of this, the licensee matched the pickup and monitor pairs and engraved identification numbers on two of the pickups. Maintenance Engineering personnel contacted the vendor that calibrated the CSI monitors and determined that exchanging pickups could give results five percent higher than expected. The inspector reviewed calibration records for three IRD monitors and verified they were correctly paired.

The inspector also identified, during discussions with Maintenance Engineering personnel and the IST engineer following Unit 2 CCW pump tests, that the CSI monitor was not initialized with the frequency response range required by IWP-4520, Instruments to Measure Amplitude. The inspector determined that the software used to initialize the CSI monitor was not controlled in accordance with procedure 00410-C, Control of Computer Software. The licensee is establishing instructions to comply with these administrative controls.

Due to the discrepancies found with the control of the CSI vibration monitors, the inspector reviewed completed surveillances to determine if the CSI monitors had been used to fulfill IST or TS surveillance requirements. The inspector determined that a CSI vibration monitor had been used on one occasion to obtain IST data. This occurred on November 25, 1992. The data obtained was used to generate new baseline data for a Unit 2 Boric Acid

Transfer pump, following pump disassembly and maintenance, when all of the IRD monitors were offsite for calibration. The inspector reviewed the completed data sheets for procedure 14811-2, Boric Acid Transfer Pumps and Discharge Check Valves Inservice Test, and noted that the procedure was temporarily revised to require an IRD monitor or an equivalent CSI monitor with a velocity pickup calibrated to a ± 5 percent accuracy as a pair. The CSI monitor used for this surveillance was one of the CSI monitors mentioned above which had an exchanged pickup. The inspector could not determine when the pickups had been exchanged; however, based on a review of subsequent data acquired with a calibrated monitor, the inspector concluded that the November 1992 B ATP surveillance was acceptable.

The TS requirements were met in all the tests which the inspector observed. However, since the licensee intended to use the CSI monitors for future TS surveillances, the inadequate control of the CSI monitors could have resulted in unreliable vibration data. The inspector considered the lack of control of the CSI monitors and pickup pairs, and the improper initialization of the frequency response range of the CSI monitors, a weakness in the control of M&TE used during IST surveillances.

No violations or deviations were identified.

4. Maintenance Observation (62703)

a. General

The inspectors observed maintenance activities, interviewed personnel, and reviewed records to verify that work was conducted in accordance with approved procedures, TSs, and applicable industry codes and standards. The inspectors also frequently verified that redundant components were operable, administrative controls were followed, clearances were adequate, personnel were qualified, correct replacement parts were used, radiological controls were proper, fire protection was adequate, adequate post-maintenance testing was performed, and independent verification requirements were implemented. The inspectors independently verified that selected equipment was properly returned to service.

Outstanding work requests were reviewed to ensure that the licensee gave priority to safety-related maintenance activities.

The inspectors witnessed or reviewed the following maintenance activities:

<u>MWO NOS.</u>	<u>WORK DESCRIPTION</u>
19102176	Inspect Leakage on Containment Spray Pump A
19202222	Repair SG Blowdown HX#5 Flange Leak
19203054	Restroke Steam Dump Valve 1TV500F from 9 to 56 psig.
19203937	Calibrate Loop 1F-1819B
19201839	Repair Leaking Flange on CCP 1A
19203737	PM on Containment Spray Pump 1A
29300246	A-Train DG Room Dampers Will Not Close
29300372	Check Packing Leak CS Pump 2B

b. Diesel Generator Room Dampers

During a Control Room review of active and Information LCOs the inspector identified an Information LCO on the 2A DG room wall dampers which had been in effect since February 1992. There was also a similar Information LCO on Unit 1 which had been in effect for a shorter time. The inspector was concerned that the licensee may have not taken timely action to repair the problem.

Information LCOs do not indicate actual entry into an action statement but are a method of tracking a safety related equipment malfunction or changes in plant parameters which could restrict unit operation if another problem occurs. This Information LCO covered the DG 2A wall dampers which are part of the DG HVAC system covered in TS 3.7.13, Diesel Generator Building and Auxiliary Feedwater Pump House ESF HVAC Systems.

The DG HVAC system functions to remove heat from the building during DG operation and to supply sufficient heat, when the diesels are not operating, to allow easy starting of the DGs and to allow personnel occupancy. The HVAC system in the DG building is divided into two subsystems, ESF and non-ESF. On a DG start the dampers open to exhaust air to maintain building temperature. While the DG is idle, the dampers function as air intakes with the non-ESF fan to maintain building temperature. In this case the dampers were inoperable; but as a compensatory action they had been failed open and were, therefore, considered operable since they would fulfill their design function.

The inspector reviewed the licensee's engineering evaluation and found that the analysis had determined that with the dampers failed open the resulting air flow would remain above the calculated flow necessary to maintain the DG room ambient temperature below the maximum design temperature during a design basis accident. The inspector also reviewed the effects of cold temperatures. Cold winter temperatures have been documented at some plants as affecting governor oil temperatures which affects DG operability. The licensee's evaluation had found that this was not a concern at Vogtle. The inspector was satisfied with the licensee's compensatory actions and justification for their actions.

The inspector, however, did conclude that the licensee had not expeditiously corrected the damper problems. These problems had existed for over a year on one DG. In response to the inspector's concerns the licensee has undertaken a program to test every DG damper, improve their performance and replace defective parts.

c. Potential Defect In MFIV Four-Way Hydraulic Valves

On October 29, 1992, Anchor/Darling Valve Company notified GPC of a potential defect in the hydraulic four-way valves supplied with the Vogtle MFIVs. These four-way valves direct hydraulic fluid to open or close the MFIV during normal valve stroking and fast closure during a main feedwater isolation. Each MFIV has redundant hydraulic closure trains with two four-way valves in each closure train. Either train is capable of closing the MFIV.

Anchor/Darling determined that the valve bodies may have been manufactured with elongated bores. During normal operation, the excess bore dimensions may permit extrusion of the lock ring and eventually the o-ring. Failures of these components could prevent the safety-related closure function of the MFIVs. This discrepancy is limited to four-way valves manufactured with pre-1600 serial numbers. Vogtle performed field walk-downs and discovered that all four-way valves in service are in the potentially defective lot. Thirteen spare valves were located in the warehouse, nine of which were of the affected lot.

The licensee, from discussions with other utilities with similar MFIVs, learned that a valve with the elongated bore would likely fail rapidly after initial installation. Such a failure could result in slower closure times for the MFIV and could be preceded by a "low hydraulic accumulator pressure" alarm. There has been no indication of such failures at Vogtle. However, since the Vogtle MFIVs have redundant hydraulic closure trains, the licensee considers that a simultaneous failure of both MFIV closure trains does not appear to be a credible possibility. The licensee plans to replace all of the MFIV four-way valves during upcoming refueling outages. The inspector reviewed the Part 21 notification and the licensee's response and determined that the

actions appear to be appropriate based on industry experience and vendor recommendations.

No violations or deviations were identified.

5. Refueling (60710)

During this inspection period the inspectors observed the receipt, inspection, and storage of new fuel as several fuel shipments arrived on site for the upcoming 1R4 refueling outage. There was good coordination between Operations, Security, Quality Control, Health Physics, and Maintenance as each shipment arrived and was off loaded into the new fuel storage vault. The inspectors observed the activities of the QC inspector as he monitored the receipt of the new fuel and verified that the the new fuel inspection checklist was properly completed. Discussions were also held with a Reactor Engineer who was present while the new fuel was unloaded. The inspectors were satisfied that the new fuel receipt had been handled carefully and with good preplanning.

6. Follow-up (92701) (92702)

The following items were reviewed using licensee reports, inspection record review, and discussions with licensee personnel as appropriate:

- a. (Closed) 50-424, 425/P21 (Part 21), 92-248, Potential Defect in Cylinder Heads of Enterprise Standby Diesel Generators Results In a Minute Cooling Water Leak Into the Lube Oil System.

On November 25, Cooper Energy Service issued a Part 21 notification to members of the TDI Diesel Owners Group which identified the existence of a potential problem with DG cylinder heads cast prior to August 1, 1984. The defect was discovered when traces of engine cooling water were found in samples of lube oil in one of the DGs at a Gulf States Utilities Company. Subsequent hydro testing and exploratory machining was performed on the suspected defective cylinder head. During the testing some wetness was identified at the bottom of one 3/4"-10 capscrew hole located on the top side of the head. Further inspection revealed a very thin wall section between the tapped hole and the interior casting surface. Cylinder heads cast after July 1984, were modified such that this potential defect was eliminated. Cooper Energy Services determined that the root cause for the failure of the cylinder head was due to inadequate casting wall thickness at the tapped hole.

Cooper recommended that until long term corrective action was determined, lube oil analysis should be performed monthly to monitor for jacket water contamination. Vogtle was already performing monthly lube oil analysis and had not identified any abnormalities in moisture content of the lube oil. The inspector

confirmed that the recommended interim actions will continue until the recommended long term actions are completed.

On December 17, 1992, Cooper Energy Service issued a follow-up letter to the Part 21 notification stating their recommended long term corrective action. That action involved the application of Loctite Hydraulic Sealant to the suspect threaded hole and stud. Tests at Cooper-Bessemer proved that this repair was sufficient to withstand 100 psi of water pressure without leakage. A Service Information Memo (SIM # 384) is being issued by Cooper which explains the procedure in more detail. It was recommended that this corrective action be performed at the next scheduled refueling outage, or cold shutdown, whichever occurs first. The licensee intends to initiate the recommended actions during upcoming refueling outages. The inspector had no concerns regarding the licensee's corrective actions to this Part 21 notification.

- b. (Closed) VIO 50- 425/91-15-03; Failure To Seal Piping Penetration in AFW Pump Room.

NRC IR 91-15 identified that the licensee failed to seal piping penetration 2-59-012-1 in the Unit 2 AFW Train 'B' pump room. The penetration is located in a 3-hour fire rated wall between the AFW pump room and a pipe chase and is below the maximum flood level for the two affected rooms. The penetration had never been sealed because it had been incorrectly classified in the Penetration Seals Designation List.

The licensee took action to correct the immediate problem of the unsealed penetration by establishing compensatory fire watches until the penetration seal was installed. A MWO was generated to seal the penetration and a change request was written to correct the error in the PSDL. Sealing of the penetration was completed on July 23, 1991. To prevent future oversights of this type, the licensee initiated an REA to verify the accuracy of the Fire Protection Boundary List which is the reference document for surveillance procedure 29144-C, Fire Area Boundaries-18-Month Visual Inspection. When the boundary list verification was completed and procedure 29144-C was revised, maintenance personnel were retrained on the latest procedural requirements for inspecting fire area boundaries.

The inspector determined that the licensee's corrective actions were appropriate. This item is considered closed.

- c. (Closed) VIO 50-424,425/91-15-02; Failure to Establish Adequate Procedures

The licensee responded to this violation in correspondence dated September 4, 1991. This violation involved two examples of inadequate procedures. One example involved a procedure which

inadvertently caused an entry into TS 3.0.3. Immediately following entry into TS 3.0.3, the SS realized both trains of ECCS were inoperable and immediately took action to correct this condition. Procedures 14808-1 and 2, Centrifugal Charging Pump and Check Valve Inservice Test, were revised on July 22, 1991, to change the test methodology so that performance of the procedure on one ECCS train does not impair the operability of the redundant train. A broadness review identified four additional procedures that had discrepancies similar to procedure 14808. Those procedures were revised to prevent a recurrence of this type event.

The second example involved a manual valve in the boron injection flow path from the boric acid storage tank which was not included in the boron injection flow path verification surveillance procedure as required by TS. The instruction section for procedures 14405-1 and 2, Boron Injection Flow Path Verification During Operation, and 14406-1 and 2, Boron Injection Flow Path Verification - Shutdown, were revised to ensure that all available flow paths are identified when the surveillance procedure is performed instead of identifying only the flow paths for which credit is taken. A verification was performed on all other boron injection flow path valves to ensure they were in the correct position. Valves 1-1208-U4-482 and 2-1208-U4-482 were secured with a lock and added to the safety related locked valve program. By adding these valves to the locked valve program, the TSs allow them to be excluded from the monthly surveillance requirements, reducing the requirements to enter potentially contaminated rooms.

Based on this review of the licensee's corrective actions, this item is closed.

No violations or deviations were identified.

7. Exit Meeting

The inspection scope and findings were summarized on January 29, 1993, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during the inspection.

8. Abbreviations

ACOT	- Analog Channel Operational Test
AFW	- Auxiliary Feedwater System
ANII	- Authorized Nuclear Inservice Inspector
ASME	- American Society of Mechanical Engineer
BATP	- Boric Acid Transfer Pump
CCP	- Centrifugal Charging Pump
CCW	- Component Cooling Water System

CFR	- Code of Federal Regulations
CR	- Control Room
CS	- Containment Spray
CSI	- Computational Systems Incorporated
CVE	- Containment Ventilation Isolation
DC	- Deficiency Card
DG	- Diesel Generator
DPM	- Data Processing Module
ECCS	- Emergency Core Cooling Systems
EOP	- Emergency Operating Procedures
ERF	- Emergency Response Facilities
ESF	- Engineered Safety Feature
GPC	- Georgia Power Company
HVAC	- Heating Ventilation and Air Conditioning
HX	- Heat Exchanger
INPO	- Institute for Nuclear Power Operations
IR	- Inspection Report
IR4	- Unit 1 Refueling Outage 4
ISEG	- Independent Safety Engineering Group
IST	- In-Service Test
LCO	- Limiting Condition for Operation
LDCR	- Licensing Document Change Request
LER	- Licensee Event Report
M&TE	- Measuring and Test Equipment
MFIV	- Main Feedwater Isolation Valve
MOV	- Motor Operated Valve
MWO	- Maintenance Work Order
NCV	- Non-Cited Violation
NPF	- Nuclear Power Facility
NRC	- Nuclear Regulatory Commission
NRR	- Nuclear Reactor Regulation
NSCW	- Nuclear Service Cooling Water System
PA	- Protected Area
PEO	- Plant Equipment Operator
PERMS	- Process and Effluent Radiological Monitoring System
PSIG	- Pounds Per Square Inch Gage
RCS	- Reactor Coolant System
REA	- Request for Engineering Assistance
RER	- Request for Engineering Review
RO	- Reactor Operator
RWST	- Refueling Water Storage Tank
SAER	- Safety Audit And Engineering Review
SER	- Significant Event Report (INPO)
SG	- Steam Generator
SI	- Safety Injection
SPDS	- Safety Parameter Display System
SS	- Shift Superintendent
SSPS	- Solid State Protection System
TS	- Technical Specifications
TSC	- Technical Support Center
URI	- Unresolved Item
USS	- Unit Shift Supervisor

VIO	- Violation
WRT	- Work Request Tag
WWRB	- Waste Water Retention Basin

JAN 11 1994

Docket Nos. 50-424, 50-425
License Nos. NPF-68, NPF-81

Georgia Power Company
ATTN: Mr. C. K. McCoy
Vice President
Vogtle Electric Generating Plant
P. O. Box 1295
Birmingham, AL 35201

Gentlemen:

SUBJECT: NRC INSPECTION REPORT NOS. 50-424/93-27 AND 50-425/93-27

This refers to the inspection conducted by B. Bonser of this office on November 21 - December 18, 1993. The inspection included a review of activities authorized for your Vogtle facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

The enclosed Inspection Report identifies activities that violated NRC requirements that will not be subject to enforcement action because the licensee's efforts in identifying and/or correcting the violation meet the criteria specified in Section VII.B. of the Enforcement Policy.

In accordance with 10 CFR 2.790(a), a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

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

Sincerely,

ORIGINAL SIGNED BY
ALAN R. HERDT

Alan R. Herdt, Chief
Reactor Projects Branch 3
Division of Reactor Projects

Enclosure:
NRC Inspection Report

cc w/encl: (See page 2)

9/0124/0078

Enclosure 5

Georgia Power Company

2

JAN 11 1994

cc w/encl:

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cc w/encl: Continued page 3

Georgia Power Company

3

JAN 11 1994

cc w/encl: Continued
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UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA STREET, N.W., SUITE 2900
 ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-424/93-27 and 50-425/93-27

Licensee: Georgia Power Company
 P. O. Box 1295
 Birmingham, AL 35201

Docket Nos.: 50-424 and 50-425

License Nos.: NPF-68 and NPF-81

Facility Name: Vogtle 1 and 2

Inspection Conducted: November 21, 1993 - December 18, 1993

Inspector:	<u><i>Deborah A. [Signature]</i></u>	<u>1-10-94</u>
	for B. R. Bonser, Senior Resident Inspector	Date Signed
	<u><i>R. D. Starkey [Signature]</i></u>	<u>1-10-94</u>
	for R. D. Starkey, Resident Inspector	Date Signed
	<u><i>P. A. Barman [Signature]</i></u>	<u>1-10-94</u>
	for P. A. Barman, Resident Inspector	Date Signed

Approved by:	<u><i>Eric A. Skinner [Signature]</i></u>	<u>1-11-94</u>
	P./Skinner, Chief Reactor Projects Section 3B Division of Reactor Projects	Date Signed

SUMMARY

Scope: This routine, inspection entailed inspection in the following areas: plant operations, surveillance, maintenance, Engineered Safety System walkdown, evaluation of licensee self-assessment and follow-up of open items.

Results: One non-cited violation (NCV) was identified.

The NCV involved a failure to initial and date applicable line entries on a Unit Operating Procedure checklist for systems not designated for lineup following the most recent Unit 1 refueling outage. The initials would have indicated a current system status was verified (paragraph 2d).

A review of system alignment procedures and alignment documentation identified several documentation and administrative problems. The problems identified were not safety significant. There were no systems found out of alignment and the licensee

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maintains several other programs to ensure configuration control (paragraph 2d).

Overspeed trips of the Unit 2 Turbine Driven Auxiliary Feedwater (TDAFW) Pump during surveillance testing were reviewed. The inspectors concluded that the licensee had adequately resolved the problems identified with TDAFW pump and in the process had uncovered some errors related to troubleshooting and electrical overspeed device calibration (paragraph 4b).

The inspector reviewed the licensee's resolution of an unpinned residual heat system seismic strut. The licensee conservatively declared the system inoperable upon identification of this degraded condition. Restoration of the strut was prompt and support engineering promptly evaluated the condition and determined its significance. The licensee response to this issue was adequate, timely and conservative, and focussed on the safety of the plant (paragraph 6).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *J. Beasley, General Manager Nuclear Plant
- *P. Burwinkel, Plant Engineering Supervisor
- W. Burmeister, Manager Engineering Support
- *S. Chesnut, Manager Engineering Technical Support
- *C. Christiansen, SAER Supervisor
- *R. Dorman, Manager Training and Emergency Preparedness
- *G. Frederick, Manager Maintenance
- *W. Gabbard, Nuclear Specialist, Technical Support
- *J. Gasser, Unit Superintendent
- *M. Griffis, Manager Plant Modifications
- K. Holmes, Manager Operations
- D. Huyck, Nuclear Security Manager
- W. Kitchens, Assistant General Manager Plant Support
- R. LeGrand, Manager Health Physics and Chemistry
- G. McCarley, ISEG Supervisor
- M. Sheibani, Nuclear Safety and Compliance Supervisor
- C. Stinespring, Manager Administration
- *J. Swartzwelder, Manager Outage and Planning
- *C. Tynan, Procedures Supervisor
- J. Williams, Outage and Planning Supervisor

Other licensee employees contacted included technicians, supervisors, engineers, operators, maintenance personnel, quality control inspectors, and office personnel.

Oglethorpe Power Company Representative

T. Mazingo

NRC Resident Inspectors

- *B. Bonser
- *D. Starkey
- *P. Balmain

*Attended Exit Interview

An alphabetical list of abbreviations is located in the last paragraph of the inspection report.

2. Plant Operations - (71707)

a. General

The inspection staff reviewed plant operations throughout the reporting period to verify conformance with regulatory requirements, TSs, and administrative controls. Control logs, shift supervisors' logs, shift relief records, LCO status logs, night orders, standing orders, and clearance logs were routinely reviewed. Discussions were conducted with plant operations, maintenance, chemistry, health physics, engineering support and technical support personnel. Daily plant status meetings were routinely attended.

Activities within the CR were monitored during shifts and shift changes. Actions observed were conducted as required by the licensee's procedures. The complement of licensed personnel on each shift met or exceeded the minimum required by TS. Direct observations were conducted of CR panels, instrumentation and recorder traces important to safety. Operating parameters were verified to be within TS limits. The inspectors also reviewed DCs to determine whether the licensee was appropriately documenting problems and implementing corrective actions.

The inspectors observed that Operations management has undertaken an initiative to increase the effectiveness of CR operations. This effort includes a reduction of lit or disabled CR annunciators, a reduction of inoperable or degraded CR instrumentation and chart recorders, and a reduction of Caution tags on the control board. The inspectors agreed that a reduction of these conditions can only serve to enhance CR operations and reduce operator distractions. The inspectors will continue to monitor progress in this area.

Plant tours were taken during the reporting period on a routine basis. They included, but were not limited to the turbine building, the auxiliary building, electrical equipment rooms, cable spreading rooms, NSCW towers, DG buildings, AFW buildings, and the low voltage switchyard.

During plant tours, housekeeping, security, equipment status and radiation control practices were observed.

The inspectors verified that the licensee's health physics policies/procedures were followed. This included observation of HP practices and review of area surveys, radiation work permits, postings, and instrument calibration.

The inspectors verified that the security organization was properly manned and security personnel were capable of performing their assigned functions. Inspectors observed that persons and

packages were checked prior to entry into the PA; vehicles were properly authorized, searched, and escorted within the PA; persons within the PA displayed photo identification badges; and personnel in vital areas were authorized.

b. Unit 1 Summary

The unit began the period operating at 100% power and operated at full power throughout the inspection period.

c. Unit 2 Summary

The unit began the inspection period at 100% power. On December 3, power was reduced to 20% to permit performance of steam generator hideout return chemistry testing and to make repairs to Heater Drain Pump B. Testing and maintenance activities were completed on December 4 and ascension to 100% power was started. The unit reached 100% power on December 6 and remained there throughout the remainder of the inspection period.

d. Review of System Alignment Procedures

During this inspection period the inspector reviewed UOPs and system alignment procedures to determine if system alignments were performed as required following recent refueling outages. Lineup program requirements are contained in procedure 10000-C, Conduct of Operations, and in the UOPs. Program requirements in procedure 10000-C establish administrative requirements for performing system lineups, maintaining a system status file and the performance of periodic lineups at least every 30 months. The UOPs direct the performance of selected system lineups following a refueling outage. Requirements for performing system lineups in the UOPs are provided in a checklist attached to the UOP. Systems that must have an alignment are designated on the checklist by the Manager of Operations or his designee. Systems are aligned using specific system alignment procedures.

The inspector found some of the system alignment procedures requirements to be unclear. UOP requirements did not clearly state the level of completion desired or give acceptance criteria, and appeared to conflict with procedure 10000-C requirements. Guidance for the timeliness of lineup completion was not given in procedure 10000-C or the UOPs.

The inspector reviewed completed copies of UOP 12001-C, Unit Heat Up To Hot Shutdown, for refueling outages 1R4, 1R3, 2R3 and 2R2; and reviewed a sample of the completed system lineup procedures performed during 1R4. The inspector identified several systems in UOP 12001-C, Checklist 1, System Requirements for Unit Startup, completed for 1R4, that were not designated for lineup and were not signed off as being verified. Guidelines in Checklist 1 require that systems not designated for alignment must be verified

by ensuring that a current alignment is on file in the system status file. A sample of safety related system lineups were reviewed by the inspector and found to be current.

The inspector also identified several systems where partial lineup procedures were performed during outage 1R4 and were not completed promptly following 1R4. Normal practice has been to perform partial lineups to support an evolution during an outage and complete the remainder of the lineup shortly after the outage. The inspector did not identify any discrepancies on the completed procedure 12001-C checklists reviewed for the other refueling outages. The inspector also verified with the licensee that the lineups performed during 1R4 were reviewed by the licensee to assure they would support the desired evolutions and the exceptions left did not warrant additional action.

The inspector found that the signature continuation sheets were not always used when the system lineup procedure signature/comment page was full. Operations personnel completing the system lineup procedures used the comments and resolution section as signature continuation sheets. Comments and exceptions were documented in the body of the field copies of the alignment procedures, which were not retained.

The inspector considered the issues described above as documentation and administrative problems and of no safety significance. There were no systems found out-of-alignment and the licensee maintains several other programs to ensure configuration control. These include the clearance and tagging program, safety related locked valve manipulation controls, system operating procedures, operator rounds, and surveillance procedures which are performed prior to mode changes and periodically as required by TS. In addition, the inspectors have observed no significant events following recent refueling outages which indicate a configuration control problem. However, failure to initial and date the applicable line entries for nondesignated systems on Checklist 1, System Requirements for Unit Startup, of procedure 12001-C, to indicate a current system status was verified, is a violation of UOP 12001-C requirements. This NRC identified violation is not being cited because criteria specified in section VII.B of the enforcement policy were satisfied. This item is identified as NCV 50-424/93-27-01, Failure to Document Verification of Alignment Status Prior to Unit 1 Startup. The inspector found that these problems were isolated to 1R4.

The licensee has acknowledged the problems identified and committed to review and revise their guidance for performing system lineups.

One violation was identified.

3. Surveillance Observation (61726)

Surveillance tests were reviewed by the inspectors to verify procedural and performance adequacy. The completed tests reviewed were examined for necessary test prerequisites, instructions, acceptance criteria, technical content, data collection, independent verification where required, handling of deficiencies noted, and review of completed work. The tests witnessed, in whole or in part, were inspected to determine that approved procedures were available, equipment was calibrated, prerequisites were met, tests were conducted according to procedure, test results were acceptable, and systems restoration was completed.

<u>SURVEILLANCE NO.</u>	<u>TITLE</u>
24060-2	AFW Pump Turbine Speed Indication and Control 2S-15109 Channel Calibration.
14810-2	TDAFW Pump and Check Valve IST.
14701-2	Reactor Trip Breakers UV and Shunt Trip Test
28911-102,104	Weekly Battery Inspection

The inspectors did not identify any problems or concerns during the observation of these surveillance activities.

No violations or deviations were identified.

4. Maintenance Observation (62703)

a. General

Maintenance activities were observed and/or reviewed during the reporting period to verify that work was conducted in accordance with approved procedures, TSs, and applicable industry codes and standards. Activities, procedures, and work orders were examined to verify proper authorization to begin work, provisions for fire, cleanliness, and exposure control, proper return of equipment to service, and that limiting conditions for operation were met.

The inspectors witnessed or reviewed the following maintenance activities:

<u>MWO NOS.</u>	<u>WORK DESCRIPTION</u>
29303900	TDAFW Trips On Mechanical Overspeed
19302946	Replace Feedwater RTDs 15200-15203

29302246 Perform PM On TDAFW Trip Linkage
19303080 Valve 1HV7126 Exceeded IST Action Time

The inspectors did not identify any problems or concerns during the observation of these maintenance activities.

b. Overspeed Trip of Unit 2 TDAFW Pump

On November 29, the Unit 2 TDAFW turbine tripped on mechanical overspeed during routine performance of surveillance procedure 14810-2, TDAFW Pump and Check Valve IST. Shortly before the surveillance test, maintenance personnel had performed a routine PM task (MWO 29302246) that included cleaning, lubrication, and verification of free movement of trip linkages and governor valve linkages. Operations supervision believing that the overspeed trip was related to the linkage PM attempted a second TDAFW pump start after resetting the mechanical overspeed trip mechanism. The turbine again tripped on mechanical overspeed.

Neither of the two mechanical overspeed trips was preceded by an electrical overspeed trip which should have occurred first. The setpoint for an electrical overspeed trip is 110% (4620 rpm) of the turbine normal speed of 4200 rpm, while the mechanical overspeed trip setpoint is 115% (4830 rpm) of 4200 rpm.

Troubleshooting identified the cause of both overspeed trips as a failed EG-M module in the governor circuitry and the module was replaced. This module provides speed input to the turbine governor. The licensee also determined that the electrical overspeed trip setpoint was set too high, at approximately 5042 rpm, explaining why the mechanical overspeed trip occurred first. The electrical overspeed setpoint was subsequently recalibrated to its correct value.

Following recalibration of the electrical trip and EG-M module replacement, a third turbine start was attempted. The turbine tripped, but this trip resulted from an electrical overspeed trip signal. The licensee determined that this trip was caused by binding of the governor valve linkage which caused the governor valve to remain in the full open position. The governor valve linkage was realigned and the piston servo on the governor valve linkage was replaced as a precautionary measure. On November 30, the TDAFW successfully passed its surveillance test and the LCO was exited.

The inspectors were concerned with the multiple failures identified by this surveillance test and that a problem with the electrical overspeed device occurred (see NRC IR 50-424,425/93-23). The inspectors reviewed each of the problems that occurred.

The licensee concluded that an inadequate precalibration warmup of the electrical overspeed device following the recent Unit 2 outage caused the electrical trip setpoint to drift high. The inspector reviewed the data from the post-outage calibration and the "as found" data after the November 29 trip, and determined that the data supports this conclusion of instrument drift. The inspector also reviewed procedure 24060-2, Auxiliary Feedwater Pump Turbine Speed Indication And Control 2S-15109 Channel Calibration, and the turbine vendor manual and noted that no limitations were stated in either document regarding appropriate warm-up times prior to calibration for electrical overspeed instrumentation. Discussions with the system engineer and the I&C Superintendent revealed that one to one and a half hours are necessary as a minimum warm-up period prior to calibration of this type of instrumentation. MWO records related to the electrical overspeed instrumentation calibration following the Unit 2 outage do not indicate the length of the warm-up period used prior to calibration of the electrical overspeed instrumentation.

The licensee also determined, during the root cause evaluation of the TDAFW pump trips, that the EG-M module did not fail during this event. Bench testing of the suspected failed module verified that it was working properly. Since the failure indication which the I&C technicians observed during their troubleshooting efforts on November 29 could be recreated during bench testing of the EG-M module, the licensee concluded that the technicians had apparently used the test equipment incorrectly. The licensee concluded and the inspectors agreed that the cause of the overspeed events was binding of the governor valve trip linkage which was probably related to the PM that was performed prior to the TDAFW pump surveillance. The inspectors reviewed the MWO related to the PM and did not identify any discrepancies.

The inspectors witnessed portions of the maintenance activities related to repair of the Unit 2 TDAFW pump as well as the performance of surveillance tests. The inspectors concluded that, although the TDAFW was returned to service approximately 42 hours into the 72 hour LCO, the recovery process appeared to have been unnecessarily delayed due to the improper use of test equipment by technicians while troubleshooting the EG-M module. The licensee subsequently resolved the troubleshooting error and the error related to the electrical overspeed calibration. The inspectors concluded that these maintenance related errors were isolated events and do not reflect a breakdown in the maintenance program. The inspectors also concluded that it was unwise to run the surveillance the second time on November 29, before examining the causes of the first overspeed trip and consulting with management. The inspectors discussed the issues associated with this event with plant management and will continue to monitor activities related to the TDAFW pumps.

c. Unit 1 Diesel Generator 1B Exhaust Leak

The inspectors reviewed the maintenance history of an exhaust leak on the 1B DG. A review of this issue with the DG system engineer and maintenance personnel identified that a minor exhaust leak was discovered on the 1B DG during refueling outage 1R4. The leak has discolored the exterior casing of the DG turbo charger with soot. The inspector performed a walkdown of the 1B DG and observed evidence of the leak. The inspectors review of this issue did not identify any impact on engine performance or its ability to function as an onsite emergency power source.

The inspectors were also concerned that the exhaust leak could impair local operation of the 1B DG. Two plant equipment operators present in the 1B DG room on December 1 during a surveillance test of the DG were interviewed by the inspector. Neither PEO identified any significant exhaust leakage. The inspectors also have been present in the room while the 1B DG is running and have not detected exhaust leakage in the room. In addition, during DG operation the diesel building HVAC system is running which is constantly moving a large volume of air through the building.

The licensee determined that the leak is located under the jacket water shroud at the top of the engine. The licensee suspected that a flexible connection under this shroud is the source of the leak. Since the leak did not impact operation of the DG, the licensee postponed repair because extensive disassembly of the jacket water shroud would be required to access the leaking coupling. The licensee intends to repair the leak during the ten year DG checkout, or earlier if it worsens. The current revision of procedure 27578-C, Ten Year Diesel Generator Checkout, section 4.21, requires that the exhaust flex connection be visually inspected for evidence of cuts, holes, and dents. Based on this review, the inspector concluded that the existing leak on the 1B DG is not significant. The inspector also determined that the licensee is aware of the condition and will repair it during a future periodic DG checkout.

d. Diesel Generator Air Flow Directional Vanes

The inspectors learned that an inspection of a TDI DG at an other site had found that the generator air flow directional vanes were not securely attached and had the potential for coming loose and causing damage to the generator. The air flow directional vanes are stationary vanes tack-welded to the inside of the generator shroud on the wire covered opening. The vanes help direct air as the generator rotor rotates.

The inspectors brought this concern to the licensee's attention and found that a similar problem had been identified during the

performance of an 18-month surveillance procedure on DG 2A in September 1990. Maintenance had found the tack welds holding one directional air flow vane on the 2A generator cover broken. The vane had fallen off while removing the generator cover. As a result of this finding the licensee wrote MWOs to visually inspect all the vanes on the other DGs. The inspector reviewed the MWOs and found the other inspections were completed and no defects were identified. The inspector also visually examined a sample of the air flow vanes and found that they all appeared secure. The inspector had no further questions.

No violations or deviations were identified.

5. ESF System Walkdown (71710)

During this inspection period the inspector performed an ESF walkdown of the Unit 1 Control Room Emergency Filtration System. The walkdown included verification of correct valve and damper position indications in the control room and inspection of the material condition of accessible components in the plant. The inspector reviewed appropriate sections of the TSs, FSAR, system alignment procedure and P&IDs to verify proper system alignment. No discrepancies were observed during the walkdown. The inspector noted, for those items inspected, that breaker cubicle component description labels exactly matched the written description in the system line-up Procedure 11301-1, CBCR Normal KWAC and Emergency Filtration System Alignment. This is an improvement over previous ESF system walkdowns which have routinely identified labeling inconsistencies. Based on this review the inspector did not have any operability concerns with the system.

No violations or deviations were identified.

6. Licensee Resolution Of Unpinned Residual Heat System Strut (40500)

On November 25, 1993 the licensee identified an unpinned seismic strut in the Unit 2 B-train RHR pump room on the pump discharge line. The strut was found unpinned from its wall mounted clevis and resting on the clevis pin, which was pinned through the clevis. The licensee immediately entered the RHR system 72-hour LCO Action Statement until operability of the RHR system could be established. The inspector reviewed this issue to evaluate the licensee's actions for resolution of degraded and non-conforming conditions.

The licensee promptly secured the strut in place. Vogtle corporate engineering support also promptly evaluated the effect of the unpinned strut and found the support was installed to dampen dynamic loads from a seismic event and not relied on to provide support for other loads. Engineering also found, using dynamic seismic loading calculations, the system would not have been degraded in a seismic event. Based on these engineering findings it was determined that RHR system operability was not affected and the system would have performed its intended safety function. The licensee exited the 72-hour LCO Action Statement about

fifteen hours later. The licensee is also performing a root cause evaluation to determine how the strut was unpinned.

The inspector found that the licensee was conservative in declaring the RHR B-train inoperable until an engineering evaluation supporting operability was complete. Restoration of the strut was prompt and verified to be adequate by onsite engineering. Support engineering promptly evaluated the condition and determined its significance. Action to identify the root cause is still in progress. The inspector concluded that the licensee's response to this degraded condition was adequate, timely and conservative, and focussed on safety of the plant.

No violations or deviations were identified.

7. Follow-up (90712) (92700)

The Licensee Event Reports listed below were reviewed to determine if the information provided met NRC requirements. The determination included: adequacy of description, verification of TS compliance and regulatory requirements, corrective action taken, existence of potential generic problems, reporting requirements satisfied, and relative safety significance of each event.

a. (Closed) LER 50-425/93-001, Cold Overpressurization Protection Setpoints Found To Be Outside Of Technical Specifications

This LER addressed a finding by the licensee that identified that the low temperature lift settings of the Unit 2 PORVs were incorrect, and that these values, on several occasions, had been relied on to meet TS requirements for the COPS. The licensee's analysis determined that although the setpoints were nonconservative this condition would not have caused a challenge to the integrity of the reactor vessel had a cold overpressurization event occurred. The inspectors agreed with the licensee's conclusions.

The licensee completed the proper scaling calculations and revised two procedures to reflect the corrected setpoints. The inspector reviewed the revised scaling calculations with Engineering, and verified that the data sheets were revised in procedures 24518-2, Reactor Coolant Pressure (Wide Range) Protection II 2P-403 Analog Channel Operational Test and Channel Calibration, and 24519-2, Reactor Coolant Pressure (Wide Range) Protection I 2P-405 Analog Channel Operational Test and Channel Calibration. The inspector also reviewed the MWO performed to recalibrated the pressure instruments. The licensee's review of the precautions, limitations and setpoints document identified no similar conditions. Based on this review of the licensee's actions, this LER is closed.

- b. (Closed) LER 50-424/93-004, Engineered Safety Feature Actuation System Sequence Operation Is Initiated During Testing

This LER addressed an ESF actuation caused by a design flaw in a circuit card in the ESFAS sequencer. The sequencer flaw and the ESF actuation were discussed in NRC Inspection Report 50-424, 425/93-07. This sequencer flaw would not have affected sequencer operation during normal use.

The licensee promptly modified the circuit cards in both Unit 1 sequencers and during the recent Unit 2 refueling outage (October 1993) replaced the flawed cards with modified cards. The inspector reviewed the MWO's to verify the work was completed.

Based on this review of the licensee's actions this LER is closed.

No violations or deviations were identified.

8. Exit Meeting

The inspection scope and findings were summarized on December 21, 1993, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during the inspection.

<u>Item No.</u>	<u>Description and Reference</u>
NCV 424/93-27-01	Failure to Document Verification of Alignment Status Prior to Unit 1 Startup

9. Abbreviations

AFW	- Auxiliary Feedwater System
CBCR	- Control Building Control Room
CFR	- Code of Federal Regulations
CR	- Control Room
DC	- Deficiency Card
DG	- Diesel Generator
ESF	- Engineered Safety Feature
ESFAS	- Engineered Safety Features Actuation System
FSAR	- Final Safety Analysis Report
HP	- Health Physics
HVAC	- Heating, Ventilating and Air Conditioning
I&C	- Instrumentation and Controls
IR	- Inspection Report
ISEG	- Independent Safety Engineering Group
IST	- Inservice Test

LCO	- Limiting Condition for Operation
LER	- Licensee Event Report
MWO	- Maintenance Work Order
NCV	- Non-Cited Violation
NPF	- Nuclear Power Facility
NRC	- Nuclear Regulatory Commission
NSCW	- Nuclear Service Cooling Water System
PA	- Protected Area
PEO	- Plant Equipment Operator
PM	- Preventive Maintenance
PORV	- Power-Operated Relief Valve
RHR	- Residual Heat Removal System
rpm	- Rotations Per Minute
RTD	- Resistance Temperature Detector
SAER	- Safety Audit And Engineering Review
TDAFW	- Turbine Driven Auxiliary Feedwater
TDI	- Transamerica Delaval Incorporated
TS	- Technical Specifications
UOP	- Unit Operating Procedure
1R3	- Unit 1 Third Refueling Outage
1R4	- Unit 1 Fourth Refueling Outage
2R2	- Unit 2 Second Refueling Outage
2R3	- Unit 2 Third Refueling Outage

FEB 15 1994

50-424, 50-425
License Nos. NPF-68, NPF-81

Georgia Power Company
ATTN: Mr. C. K. McCoy
Vice President
Vogtle Electric Generating Plant
P. O. Box 1295
Birmingham, AL 35201

Gentlemen:

SUBJECT: NRC INSPECTION REPORT NOS. 50-424/93-29 AND 50-425/93-29

This refers to the inspection conducted by B. Bonser of this office on December 19, 1993 - January 22, 1994. The inspection included a review of activities authorized for your Vogtle facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

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

In accordance with 10 CFR 2.790(a), a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

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

Sincerely,

ORIGINAL SIGNED BY
ALAN R. HERDT

Alan R. Herdt, Chief
Reactor Projects Branch 3
Division of Reactor Projects

Enclosure:
NRC Inspection Report

cc w/encl: (See page 2)

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PDR ADOCK 05000424
G PDR

Enclosure 6

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IEO1

Georgia Power Company

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FEB 15 1994

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cc w/encl: Continued page 3

Georgia Power Company

3

FEB 15 1994

cc w/encl: Continued
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02/15/94



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA STREET, N.W., SUITE 2900
 ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-424/93-29 and 50-425/93-29

Licensee: Georgia Power Company
 P. O. Box 1295
 Birmingham, AL 35201

Docket Nos.: 50-424 and 50-425

License Nos.: NPF-68 and NPF-81

Facility Name: Vogtle 1 and 2

Inspection Conducted: December 19, 1993 - January 22, 1994

Inspector:	<u><i>B. R. Bonser</i></u>	<u>2.15.94</u>
	for B. R. Bonser, Senior Resident Inspector	Date Signed
	<u><i>R. D. Starkey</i></u>	<u>2.15.94</u>
	for R. D. Starkey, Resident Inspector	Date Signed
	<u><i>P. A. Balmain</i></u>	<u>2.15.94</u>
	for P. A. Balmain, Resident Inspector	Date Signed

Accompanied by: Deborah A. Seymour

Approved by:	<u><i>P. Skinner</i></u>	<u>2.15.94</u>
	P. Skinner, Chief Reactor Projects Section 3B Division of Reactor Projects	Date Signed

SUMMARY

Scope: This routine, inspection entailed inspection in the following areas: plant operations, surveillance, maintenance, Engineered Safety Feature System walkdown, cold weather preparation, and follow-up of open items.

Results: One Inspector Follow-up Item (IFI) was identified.

An uncontrolled dilution occurred on Unit 2 as a result of the unit reactor operator failing to maintain focus on an activity that changed core reactivity. The inspectors considered this a personnel error by the operator to self check and verify. An improvement has been noted in reducing the number of personnel errors and this event appears to be isolated (paragraph 2e).

During this inspection period two automatic reactor trips occurred on Unit 2. The first trip resulted from a fault in the Vogtle high voltage switchyard. The second trip was caused by several conditions which together resulted in a turbine trip/reactor trip.

An IFI was opened related to the second trip to review instrument failures which contributed to the event and review other applications of this type instrumentation (paragraph 2f).

Cold weather preparations were reviewed. The inspectors found that a cold weather program has been implemented and appropriate actions are taken when cold weather is expected. During this inspection period unusually cold weather was experienced (paragraph 5).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *J. Beasley, General Manager Nuclear Plant
- *W. Burmeister, Manager Engineering Support
- *S. Chesnut, Manager Engineering Technical Support
- *C. Christiansen, SAER Supervisor
 - R. Dorman, Manager Training and Emergency Preparedness
- *G. Frederick, Manager Maintenance
 - W. Gabbard, Nuclear Specialist, Technical Support
- *J. Gasser, Unit Superintendent
- *M. Griffis, Manager Plant Modifications
- *K. Holmes, Manager Operations
- *D. Huyck, Nuclear Security Manager
 - W. Kitchens, Assistant General Manager Plant Support
 - R. LeGrand, Manager Health Physics and Chemistry
- *W. Mundy, Senior Nuclear Specialist
- *G. McCarley, ISEG Supervisor
- *M. Seepe, Radwaste Supervisor
- *M. Sheibani, Nuclear Safety and Compliance Supervisor
 - C. Stinespring, Manager Administration
- *J. Swartzwelder, Manager Outage and Planning
 - C. Tynan, Procedures Supervisor
- *T. Webb, Engineer Technical Support

Other licensee employees contacted included technicians, supervisors, engineers, operators, maintenance personnel, quality control inspectors, and office personnel.

Oglethorpe Power Company Representative

T. Mozingo

NRC Resident Inspectors

- *B. Bonser
- *D. Starkey
- P. Balmain

*Attended exit meeting

An alphabetical list of abbreviations is located in the last paragraph of the inspection report.

2. Plant Operations - (71707)

a. General

The inspection staff reviewed plant operations throughout the reporting period to verify conformance with regulatory requirements, TSs, and administrative controls. Control logs, shift supervisors' logs, shift relief records, LCO status logs, night orders, standing orders, and clearance logs were routinely reviewed. Discussions were routinely conducted with plant operations, maintenance, chemistry, health physics, engineering support and technical support personnel. Daily plant status meetings were routinely attended.

Activities within the control room were monitored during shifts and shift changes. Actions observed were conducted as required by the licensee's procedures. The complement of licensed personnel on each shift met or exceeded the minimum required by TS. Direct observations were conducted of control room panels, instrumentation and recorder traces important to safety. Operating parameters were verified to be within TS limits. The inspectors also reviewed DCs to determine whether the licensee was appropriately documenting problems and implementing corrective actions.

Plant tours were taken during the reporting period on a routine basis. They included, but were not limited to the turbine building, the auxiliary building, electrical equipment rooms, cable spreading rooms, NSCW towers, DG buildings, AFW buildings, and the low voltage switchyard.

During plant tours, housekeeping, security, equipment status and radiation control practices were observed.

b. Unit 1 Summary

The unit began the period operating at 100% power and operated at full power throughout the inspection period.

c. Unit 2 Summary

The unit began the inspection period at 100% power. On January 7, 1994, the unit automatically tripped from 100% power due to a fault in the high-voltage switchyard. On January 8, the unit commenced a startup and reentered Mode 1. The unit reached 100% power on January 10. On January 19, the unit automatically tripped from 98.5% power due to a turbine trip on high MSR level caused by the tripping of HDP B (see paragraph 2.e). The unit entered Mode 2 later in the day on January 19 and entered Mode 1 on January 20. The unit reached 100% power on January 21 and operated there through the end of the inspection period.

d. Unit 2 Reactor Trip Due To Switchyard Fault

At 10:53 pm on January 7, 1994, Unit 2 automatically tripped from 100% power. The reactor trip was caused by a turbine trip. The turbine tripped on a main generator loss of load when both generator output breakers opened in the high voltage switchyard.

The initiating event was a fault on the Scherer shunt reactor located in the high voltage switchyard adjacent to the Vogtle Plant. The Scherer shunt reactor is a device that is located within the Vogtle high voltage substation that is used to control the capacitance of the 500 kV system. The Scherer 500 kV line is one of two 500 kV lines in the high voltage switchyard. The fault caused two air operated circuit breakers to open isolating the Scherer line. One of these breakers was one of the two generator output breakers. Operation of the two breakers to isolate the shunt reactor fault reduced control air pressure in the receivers at each breaker below a setpoint which actuated a backup protection scheme. This resulted in four additional breakers opening in the high voltage switchyard including the second generator output breaker.

All systems in the plant responded normally. During this event offsite power was not lost and all DGs were operable. Unit 2 was restarted on January 8 and returned to full power on January 10.

This event is discussed and reviewed in detail in NRC Inspection Report 424, 425/94-01.

e. Unit 2 Uncontrolled Dilution

On January 11, during a routine dilution on Unit 2, the reactor operator inadvertently set the total flow integrator incorrectly and diluted the RCS by about 715 gallons. The reactor operator intended to dilute 25 gallons but moved another digit while setting the total flow integrator allowing the dilution to continue. The flow rate of the reactor makeup water pump is about 100 gpm. The dilution continued for approximately seven minutes before the RO recognized the error. Boration and rod insertion were commenced to limit the power increase. Control bank D rods were inserted to 202 steps and power peaked at about 101.1%.

Makeup to the RCS is a routine evolution often performed several times a day. In this case the RO's attention was diverted from the task and a dilution that would have taken several seconds was allowed to continue for minutes. The inspectors concluded after reviewing this event that this was a personnel error by the RO. The procedures are clear and the RO knew the procedure and how it is performed. However, the RO failed to maintain focus on his primary responsibility of controlling core reactivity and ensuring the dilution stopped when expected.

The inspectors reviewed recent events and found no similar occurrences. However, the cause of this error was common to several past errors - a failure by personnel to self check and verify. As identified in previous reports, plant management continued to communicate their expectations in this area and adopted a program of self verification and checking. An improvement has been noted in the effort to reduce personnel errors and this event appears to be isolated. The licensee took prompt corrective action on this event by counseling the operator and briefing the CR staff on this event and management's expectations. This event is also being incorporated into operator training.

f. Unit 2 Automatic Reactor Trip Results From HDP Trip

On January 19, Unit 2 automatically tripped from 98.5% power due to a turbine trip on high moisture separator reheater level. Following the reactor trip all safety systems functioned normally. The licensee's investigation of the event determined that the event was initiated when the B HDP tripped. The licensee determined that the cause of the HDP trip was most likely a result of a steam leak on an instrument line connected to the B HDT low level switch. The leak apparently caused the switch to momentarily actuate and trip the HDP. A level transmitter that provides main control room indication is also on this instrument line. The HDT high and low level alarm switches are on a separate line and did not actuate prior to the HDP trip.

The licensee reviewed several other scenarios in addition to the steam leak which would have caused a low level condition in the B HDT and could not conclusively determine if the B HDT low level trip switch actuation caused the B HDP to trip. The licensee also investigated B HDP overcurrent relay settings since the HDP will also trip on an overcurrent condition. The results of the overcurrent relay setpoint investigation were also inconclusive.

The B HDT normally collects water which is drained from the 4B feedwater heater, the C and D MSRs, and the SGBD system. This water is then pumped by the B HDP from the B HDT to the feedwater system. When the B HDP tripped, actual level in the B HDT increased, backing up into the C and D MSRDTs and into the MSRs. The main turbine subsequently tripped when 2 out of 3 MSR high level switches actuated. The time from the B HDP trip, which initiated the transient, until the reactor trip was approximately two minutes and 20 seconds. During this time operators recognized the B HDP trip, and initiated a manual power reduction from 100% power.

In addition to the HDP trip, the licensee identified two other contributing causes to the reactor trip. The day prior to the event, the licensee removed B HDT High Level Dump Valve 2LV-4334 from service to repair seat leakage which was reducing plant

efficiency. The valve would normally open upon sensing a high level in the B HDT following a HDP trip and prevent further level increase by discharging water to the main condenser. Maintenance on the valve was expected to be completed on January 19.

The MSRDT high level dump valves also did not function properly during the transient. Had these valves functioned properly condensate would not have backed up into the MSRs.

The licensee's investigation determined that MSRDT high level switches would have opened the valves if their sensing lines were not clogged with iron oxide buildup. The licensee also found that the controllers for the MSR dump valves were misadjusted and would not respond as desired. These two problem caused the failure of both means of opening the MSRDT high level dumps while at full power.

Based on the review of this event the inspector was concerned that the plugging of instrument sensing lines and misadjustment of valve controllers could potentially affect other applications. Since these issues contributed directly to a reactor trip and led to a challenge of Unit 2 safety systems this is identified as inspector follow up item IFI 424,425/93-29-01, Review Significance of Instrumentation Failures Contributing To Unit 2 Reactor Trip. The inspector will review the licensee's corrective actions to this event as part of the LER follow-up.

No violations or deviations were identified.

3. Surveillance Observation (61726)

a. General

Surveillance tests were reviewed by the inspectors to verify procedural and performance adequacy. The completed tests reviewed were examined for necessary test prerequisites, instructions, acceptance criteria, technical content, data collection, independent verification where required, handling of deficiencies noted, and review of completed work. The tests witnessed, in whole or in part, were inspected to determine that approved procedures were available, equipment was calibrated, prerequisites were met, tests were conducted according to procedure, test results were acceptable and systems restoration was completed.

SURVEILLANCE NO.

TITLE

14546-2

Turbine Driven Auxiliary Feedwater Pump Operability Test

14803-1

CCW Pumps and Discharge Check Valves Inservice Test

14980-1	1B-Diesel Generator Operability Test
14980-2	2B Diesel Generator Operability Test

The inspectors did not identify any problems or concerns during the observation of these surveillance activities.

b. Unit 1 Rod Control System Failure

On December 28, during performance of surveillance procedure 14410-1, Control Rod Operability Test, control bank A group 1 rods H6 and H10 indicated no movement on the DRPI when the rods were inserted. This procedure is a monthly surveillance that demonstrates the operability of the shutdown and control rods. The licensee immediately entered the LCO action statement for TS 3.1.3.1, Moveable Control Assemblies, and initiated troubleshooting.

The licensee quickly determined that the rod problem was electrical and in the rod group power cabinet. Diagnostic instruments found that the two rods were getting constant full current on the stationary gripper coils, preventing rod movement. During troubleshooting, however, the two rods were driven in to 220 steps and could not be withdrawn. This became a factor in resolving the rod movement problem since the two rods were below the bank A rod insertion limit and the six hour action statement for TS 3.1.3.6, Control Rod Insertion Limits, became applicable.

The licensee placed the two rods on the DC hold bus, replaced two circuit cards, and verified operability of the rods by repeating the surveillance test within the TS action time. The cards replaced were the group A phase control card and the firing circuit card. The suspect cards were returned to the vendor as part of the root cause analysis.

The inspector observed the licensee's actions throughout this event and was satisfied the actions taken were appropriate.

c. Review of IST Vibration Procedural Requirements

The inspector reviewed training, completed IST surveillances, and interviewed plant personnel to determine if IST vibration procedural requirements were met, and to determine the acceptability of using a hand-held pencil probe for obtaining vibration measurements with the IRD-820.

The IRD-820 Vibration Monitor is a microprocessor controlled, portable, battery operated vibration meter that has been used at Vogtle for several years. Two probes can be used with the 560 velocity pickup; a pencil probe or a magnetic base probe.

Training lesson plan EL-LP-07017-00, Revision 0, IRD-820 Vibration Meter, specified the use of the magnetic base "when possible," and also stated it "provides a more stable reading." The lesson plan included instructions on the correct use of the hand-held pencil probe. Job Performance Measure EL-JP-07013, IRD-820 Vibration Meter, stated that "The magnetic pickup should be used if possible. If the probe is used, it must be held perpendicular to the surface of the machine with just enough pressure to prevent chattering."

The inspector reviewed surveillance procedure 14801-1, NSCW Transfer Pump Inservice Test, performed on August 23, 1993 for Unit 1, Train A, and on August 17, 1993, for Unit 1, Train B. Procedure 14801-1 required the use of an IRD-820 Vibration Monitor with a 560 velocity pickup. The surveillance procedure did not specify which probe to use for taking measurements. The data sheets for completed surveillance procedures did not indicate which probe was used to acquire the vibration data. Discussions with several PEOs and electrical/maintenance workers who performed vibration measurements with the IRD-820 indicated that the choice of probe was usually left to the discretion of the individual taking the measurements. In some instances, a USS would request a specific probe be used, particularly if the reported measurements were inconsistent with previous results.

The inspector found that a wide variation in vibration results could be obtained if the magnetic base probe was incorrectly seated on the component being measured, or if the pencil probe was held incorrectly. Licensee personnel indicated that vibration measurements would be repeated when the results were significantly different than previously obtained reference values; and that the hand-held pencil probe would normally be used when the test surface was not large or flat enough to correctly place the magnetic probe.

The licensee's current IST vibration procedures state a preference for the CSI-2110 Vibration Monitor. The CSI monitor is a later model, is digital, is programmable, and allows for data trending. The magnetic probe for the CSI-2110 is smaller than the magnetic probe for the IRD-820. The licensee indicated that the CSI-2110 was easier to use and eliminated much of the variability exhibited by the IRD-820. Licensee procedures contain the option of using the IRD-820 Vibration Monitor. The resident inspectors have previously reviewed the use of the CSI-2120 Vibration Monitor (see IR 50-424,425/93-02).

The inspector also reviewed IST vibration trending data maintained by the IST engineer for the Unit 1 NSCW pumps and Unit 1 SI pumps from January 1990 to the present. The inspector did not identify any pump inoperability determinations due to vibration measurements during this time frame.

The inspector concluded that the use of the pencil probe to obtain vibration measurements was acceptable. The use of the pencil probe provided more reliable data than the magnetic base when measurements were taken on irregular or small surfaces where the magnetic base would not fit. The inspector did not identify any problems with vibration measurement procedures or with the vibration measurements reviewed.

No violations or deviations were identified.

4. Maintenance Observation (62703)

a. General

Maintenance activities were observed and/or reviewed during the reporting period to verify that work was conducted in accordance with approved procedures, TSs, and applicable industry codes and standards. Activities, procedures, and work orders were examined to verify proper authorization to begin work, provisions for fire, cleanliness, and exposure control, proper return of equipment to service, and that limiting conditions for operation were met.

The inspectors witnessed or reviewed the following maintenance activities:

<u>MWO NOS.</u>	<u>WORK DESCRIPTION</u>
29304135	Recalibrate Temperature Loop for DG HVAC System
19400056	Repair Unit 1 Annunciator System
19400235	RCP #2 Undervoltage Bistable "RCP Bus 2 Ch 2" Is Tripped
29304088	Remove and Inspect 4-way valve on MFIV 2HV5227

The inspectors did not identify any problems or concerns during the observation of these maintenance activities.

b. Review of Diesel Generator Maintenance Testing.

During this inspection period the inspector reviewed documentation of DG runs to determine if DG runs conducted for surveillance or post maintenance testing during Unit 1 refueling outage 1R4 were performed in accordance with procedures.

The inspector reviewed TS surveillance records for 24 hour DG ESFAS runs performed in March 1993. Diesel generator surveillance runs of 24 hours duration are required by TS 3/4.8.1.1, A.C.

Sources. The inspector reviewed completed procedures 14666-1 and 14667-1, Train A and Train B Diesel Generator and ESFAS Test, and verified that the 24 hour surveillance runs were completed per section 5.1 of the procedures. The inspector reviewed Table 1, DG 24 Hour Run, an hourly log completed during the surveillances, and verified that the DGs were operated at required loads for the full 24 hour duration of the surveillances.

The inspector reviewed documentation of end of cycle maintenance for the 1A and 1B DGs respectively in MWOs 19203304 and 19203305 for maintenance performed during the last Unit 1 refueling outage. The review included work completion sign off sheets for the maintenance procedures used during the maintenance activities. From discussions with system engineering personnel and review of MWO 19203305 the inspector determined that the 1B DG was shut down during a 35% load break-in run. MWO documentation stated that the engine was shutdown to repair an intake elbow air leak. The inspector reviewed copies of the Unit 1 DG start log for start numbers 1B-93-288 and 1B-93-289 and noted that the engine was maintained at 35% load for 40 minutes stopped for approximately two hours and then operated for 30 minutes at 35% load.

The inspector was initially concerned that stopping the 1B DG prior to completing the entire one hour run did not meet the intent of maintenance procedure requirements. Procedure 28708-C, Alternate EOC Diesel Checkout, step 4.46.5e requires that the DG be loaded from the control room at 35% load for one hour, however the procedure does not state that the DG must be continuously run at this load for one hour. The inspector verified, by reviewing the DG start logs, that the DG was loaded to 35% load for a total of one hour and ten minutes and determined that this met the requirements of procedure 28708-C.

Based on the sample of records reviewed the inspector concluded that surveillance and maintenance runs for the diesels were performed appropriately. One example was identified where the Unit 1B DG was shut down during a 1 hour maintenance run prior to completing the entire 1 hour. The inspectors review determined that the licensee's actions were acceptable and met the requirements of procedure 28708-C.

c. Review of Unit 1 Annunciator System Malfunction

On January 10, the licensee identified a problem with the Unit 1 annunciator system that affected the normal receipt and display of all annunciators in the Unit 1 control room. The malfunction was discovered when the annunciator ringback horn began to sound continuously. The ringback horn normally sounds only when a lit annunciator alarm condition clears and returns to normal. During initial troubleshooting of the ring back problem the licensee identified that the fast flash function of all the annunciators was also not working. Normally when an alarm is received the

corresponding annunciator window illuminates with a fast flash and one of five different alarm horns sound for the panel where the annunciator window is located. The fast flash malfunction resulted in alarms being received with only the audible horn sounding and no visual fast flash display of the alarm windows. When the audible alarm was acknowledged at the control panels the incoming alarm window would illuminate with a solid display and the audible horn would silence which is the normal response.

The inspectors were concerned that the malfunctions in the annunciator system could have degraded the system's function to provide an assessment of plant conditions. The inspectors reviewed the licensee's compensatory actions taken in response to the problems, the troubleshooting and repair, and the response to NRC Information Notice 93-47, Unrecognized Loss of Control Room Annunciators.

The licensee initiated several compensatory actions to respond to the degraded condition including hourly walkdowns of the DG and TDAFW local panels and the initiation of special condition surveillance monitoring and logging significant plant parameters. Troubleshooting the annunciator system malfunction determined that a flasher/horn driver circuit card and an annunciator alarm logic circuit card had failed and caused the fast flash and ringback problems. Several additional annunciator circuit cards had also failed and resulted in isolated problems with individual alarm windows. The inspector verified by observing several alarms being received in the Unit 1 control room that the loss of the fast flash function slightly delayed the identification of an alarm. The alarms would illuminate with a solid display when the horns were acknowledged. The inspector verified by reviewing control room logs that hourly walkdowns of the DG and TDAFW local panels were performed. The inspector also observed that Data sheets 1, 3, 5, 6 and 7 of procedure 14915-1, Special Condition Surveillance Logs were initiated.

The inspector observed portions of the maintenance activities and testing of the annunciator system performed under MWO 19400056. Troubleshooting isolated the fast flash problem to logic chassis 3 in the annunciator cabinets. There are a total of 68 logic chassis in the annunciator system which contain up to 24 alarm logic cards that monitor the status of a plant parameter and provide actuation of horns and alarm windows. Each logic chassis also contains one flasher/horn driver to provide drive capability for audible horns and routing of flash and push button signals. All flash signals are generated in one miscellaneous logic chassis by a master flasher circuit card which is connected to the flasher/horn driver cards in each logic chassis.

During the maintenance activities in logic chassis 3, the inspector observed that the licensee stationed a licensed operator in the TDAFW pump room and operators in the control room performed

additional monitoring of AFW and MFP indications. This maintenance disabled alarms for these systems. The licensee also replaced other failed circuit cards in the annunciator system before returning the annunciator system to service.

The inspector reviewed the licensee's response to NRC IN 93-47 and found the licensee's actions addressed the concerns identified in the IN.

Based on this review the inspector determined that the annunciator malfunction did not render the annunciator system inoperable. The inspector noted that the licensee's compensatory actions for the degraded condition and the work performance in troubleshooting and repair of the malfunction was good.

No violations or deviations were identified.

5. Cold Weather Preparations (71714)

The objective of this inspection was to determine whether the licensee has effectively implemented a program to protect safety-related systems against extreme cold weather. To evaluate the licensee's program, the inspector walked down portions of safety-related systems which can be affected by extreme cold weather, verified that procedures were in place to inspect, calibrate, and test heat tracing and freeze protection equipment and verified that those procedures had been recently performed. The inspector also reviewed all open MWOs associated with heat tracing and discussed the freeze protection program with personnel from maintenance, operations, work planning, and engineering support.

The inspector observed that, in general, the physical condition of heat tracing and freeze protection was good. The inspector verified that operators routinely perform procedure 11877-1/2, Cold Weather Checklist, when the outside air temperature is less than or equal to 32 °F. and that WRTs are initiated when deficiencies are noted. Procedure 11901-1/2, Heat Tracing System Alignment, is performed by Operations at the required frequency. Maintenance personnel also perform surveillances on the solid state heat tracing control system and freeze protection panels at required intervals. During this inspection period the outside air temperature was less than 20 °F on several occasions and no significant freezing problems were observed. The inspector noted that during the inspection period the number of open MWOs related to freeze protection varied from 25 to 29. While that number seemed large, a review of those MWOs determined that none appeared to affect the operability of safety-related systems.

The inspector concluded that the licensee has adequately implemented a cold weather preparation program and appropriate actions are taken when extreme cold weather is expected. The inspector also concluded, after discussions with supervisory personnel in operations, maintenance, work planning and engineering support, that there is not a central point of coordination which has the responsibility of ensuring that freeze

protection deficiencies and compensatory actions are reviewed and acted upon prior to the onset of extreme cold weather.

No violations or deviations were identified.

6. ESF System Walkdown (71710)

The inspectors completed a walkdown of the Unit 2 Auxiliary Feedwater System trains A, B, and C. The review included the two condensate storage tanks, the two motor driven AFW pumps, the turbine driven AFW pump, the steam supply to the turbine driven pump, and the three AFW pumps discharge to main feedwater. The inspectors reviewed the Technical Specifications, FSAR, procedures, and the system drawings to verify the correct system lineup and correct electrical breaker positions. The examination identified no significant problems. Several minor discrepancies were identified and given to the licensee for correction. The inspectors also identified a number of examples where the valve description in the lineup procedure differed from the description on the valve tag. Room locations of some of the valves in the system lineup procedure were also incorrect. The walkdown did not identify any problems that would effect the operability of the system.

No violations or deviations were identified.

7. Follow-up (90712) (92700) (92702)

The Licensee Event Reports and violation listed below were reviewed to determine if the information provided met NRC requirements. The determination included: adequacy of description, verification of TS compliance and regulatory requirements, corrective action taken, existence of potential generic problems, reporting requirements satisfied, and relative safety significance of each event.

- a. (Closed) VIO 424/93-07-05, Failure To Take Adequate Corrective Action Results In Loss Of Decay Heat Removal, and LER 50-424/93-03, Loss Of Residual Heat Removal Due To Inadvertent Closure Of Residual Heat Removal Inlet Valve.

The licensee responded to the violation in correspondence dated June 16, 1993. The violation involved a loss of decay heat removal due to an inadequate review by I&C personnel performing maintenance on circuitry which affected an RHR pump suction valve. The I&C personnel involved were counseled regarding the importance of reviews before performing work. Other I&C personnel were briefed on the causes of this incident and the need for reviews and work controls. Also NAS circuit cards were specifically covered.

Replacement of NAS cards can cause momentary actuation of their end devices and appropriate precautions are necessary to protect equipment. The inspector verified that I&C personnel received this training. The licensee also enhanced their risk assessment

and work controls during the recent Unit 2 refueling outage to limit this type of work during periods of increased risk. This event occurred during a period of higher risk when only one train of decay heat removal was operable.

Based on this review of the licensee's corrective actions the violation and the LER are closed.

- b. (Closed) LER 50-425/93-003, Room Temperature Readings Not Performed - Missed Technical Specification Surveillance.

This event was caused by the premature use of a revision to Procedure 14001-2, Shift Area Temperature Log, prior to the completion of a design change and the appropriate change to TS. Personnel responsible for revising the procedure failed to perform an adequate review prior to revising the procedure and have been appropriately disciplined. Temperature readings were promptly taken for the three rooms involved and were found to be satisfactory. Procedure 14001-2 was revised to include the three rooms which had been deleted.

Based on a review of the licensee's corrective actions, this item is closed.

- c. (Closed) LER 50-425/93-002, Containment Personnel Airlock Found Inoperable When Interlock Found Defeated.

This event was caused by personnel error when the Unit 2 containment personnel airlock interlock was not restored prior to exiting mode 5. The individual responsible for leaving the interlock defeated was counseled regarding the importance of self-checking. Other maintenance personnel who perform airlock interlock activities were briefed on the significance of the event and the importance of ensuring that such work activities are properly completed. Procedure 25236-C, Airlock Maintenance, was revised to include a note to use Procedure 25237-C, Containment Personnel Airlock Doors, if the airlock interlocks need to be disabled or enabled.

Based on a review of the licensee's corrective actions, this item is closed.

No violations or deviations were identified.

8. Exit Meeting

The inspection scope and findings were summarized on January 24, 1994, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during the inspection.

8. Abbreviations

AFW	- Auxiliary Feedwater System
CFR	- Code of Federal Regulations
CR	- Control Room
DC	- Deficiency Card
DG	- Diesel Generator
EOC	- End of Cycle
ESF	- Engineered Safety Feature
ESFAS	- Engineered Safety Features Actuation System
°F	- Degrees Fahrenheit
FSAR	- Final Safety Analysis Report
HDP	- Heater Drain Pump
HDT	- Heater Drain Tank
HVAC	- Heating, Ventilating and Air Conditioning
I&C	- Instrumentation and Controls
IFI	- Inspector Followup Item
IN	- NRC Information Notice
IR	- Inspection Report
ISEG	- Independent Safety Engineering Group
IST	- Inservice Test
kV	- Kilovolt
LCO	- Limiting Condition for Operation
LER	- Licensee Event Report
MFP	- Main Feed Pump
MFIV	- Main Feedwater Isolation Valve
MSR	- Moisture Separator Reheater
MSRDT	- Moisture Separator Reheater Drain Tank
MWO	- Maintenance Work Order
NAS	- A type of circuit card
NPF	- Nuclear Power Facility
NRC	- Nuclear Regulatory Commission
NSCW	- Nuclear Service Cooling Water System
PEO	- Plant Equipment Operator
RCS	- Reactor Coolant System
RCP	- Reactor Coolant Pump
RHR	- Residual Heat Removal System
RO	- Reactor Operator
SAER	- Safety Audit And Engineering Review
SGBD	- Steam Generator Blowdown
SNC	- Southern Nuclear Company
SRO	- Senior Reactor Operator
SSPS	- Solid State Protection System
TDAFW	- Turbine Driven Auxiliary Feedwater
TS	- Technical Specifications
UOP	- Unit Operating Procedure
USS	- Unit Shift Supervisor
VIO	- Violation
WRT	- Work Request Tag
1R4	- Unit 1 Fourth Refueling Outage

APR 29 1994

OFFICIAL RECORD COPY

Docket Nos. 50-424, 50-425
License Nos. NPF-68, NPF-81

Georgia Power Company
ATTN: Mr. C. K. McCoy
Vice President
Vogtle Electric Generating Plant
P. O. Box 1295
Birmingham, AL 35201

Gentlemen:

SUBJECT: NRC INSPECTION REPORT NOS. 50-424/94-08 AND 50-425/94-08

This refers to the inspection conducted by B. A. Parker of this office on March 28 - April 1, 1994. The inspection included a review of activities authorized for your Vogtle facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

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

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

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

Sincerely,

151
William E. Cline, Chief
Radiological Protection and
Emergency Preparedness Branch
Division of Radiation Safety
and Safeguards

Enclosure:
NRC Inspection Report

cc w/encl: (See page 2)

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PDR

Enclosure 7

DEU

Georgia Power Company

2

cc w/encl:

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3

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SEND	OFC	RII:DRSS	RII:DRSS	RII:DRSS	RII:DRP		
TO	NAME	BParker	MGloeden	WRehner	PSkinner		
PDR?	DATE	4/29/94	4/29/94	4/29/94	4/25/94	1	194
Yes	No	Yes	No	Yes	No	Yes	No

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UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA STREET, N.W.
 ATLANTA, GEORGIA 30323

APR 29 1994

Report Nos.: 50-424/94-08 and 50-425/94-08

Licensee: Georgia Power Company
 P. O. Box 1295
 Birmingham, AL 35201

Docket Nos.: 50-424 and 50-425

License Nos.: NPF-68 and NPF-81

Facility Name: Vogtle 1 and 2

Inspection Conducted: March 28 - April 1, 1994

Inspectors: *B. A. Parker* 04/23/94
 B. A. Parker Date Signed

W. B. Gloersen 04/28/94
 W. B. Gloersen Date Signed

Approved by: *William H. Rankin* 4/29/94
 W. H. Rankin, Chief Date Signed
 Facilities Radiation Protection Section
 Radiological Protection and Emergency Preparedness Branch
 Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, announced inspection was conducted in the area of occupational radiation safety and included an examination of: organization and management controls; audits and appraisals; training and qualification; external exposure control; internal exposure control; surveys, monitoring, and control of radioactive materials and contamination; and maintaining occupational exposures as low as reasonably achievable (ALARA).

In addition, Temporary Instruction (TI) 2515/123, "Implementation of the Revised 10 CFR Part 20," dated March 15, 1994, was utilized to evaluate the licensee's program with regard to high and very high radiation areas; declared pregnant women and embryo/fetus dose; Total Effective Dose Equivalent (TEDE)/ALARA and respiratory protection; and planned special exposures (PSEs).

Results:

Based on interviews with licensee management, supervision, and station personnel, and records review, the radiation protection program continued to be effective in protecting the health and safety of the plant workers and the public. No violations or deviations were identified.

One issue concerning the TI was identified and characterized as an inspector followup item (IFI) regarding procedural requirements for PSEs (Paragraph 4.d).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *C. Burke, Nuclear Specialist I, SAER
- *S. Chesnut, Manager, Technical Support
- *C. Christiansen, Supervisor, SAER
- K. Duquette, Plant Health Physicist
- *W. Gabbard, Nuclear Specialist I, Technical Support
- *D. Huyok, Manager, Nuclear Security
- *W. Kitchens, Assistant General Manager
- *I. Kochery, Superintendent, Health Physics
- *M. Kurtzman, Supervisor, Health Physics/Chemistry Training
- *R. LeGrand, Manager, Health Physics and Chemistry
- J. Long, Technician, Health Physics
- J. Lucot, Supervisor, Health Physics
- *G. McCarley, Supervisor, ISEG
- *M. Sheibani, Supervisor, Technical Support
- *G. Swartzwelder, Manager, Outage and Planning

Other licensee employees contacted during the inspection included technicians, maintenance personnel, and administrative personnel.

Nuclear Regulatory Commission

- *P. Balmain, Resident Inspector
- B. Bonser, Senior Resident Inspector
- R. Starkey, Resident Inspector

*Denotes attendance at exit meeting held on March 31, 1994

2. Organization and Management Controls (83750)

The inspector reviewed the licensee's organization, staffing levels, and lines of authority as they relate to radiation protection. No significant changes were noted since the last inspection conducted September 20-24, 1993, and documented in NRC Inspection Report (IR) 93-22. The licensee appeared adequately staffed. Some reduction in staffing levels was accomplished through attrition with no adverse effects on function or performance in the area of radiological controls.

No violations or deviations were identified.

3. Audits and Appraisals (83750)

Technical Specification (TS) 6.4.2.8 requires that audits of plant activities be performed under the cognizance of the Safety Review Board (SRB) and that the audits shall encompass, in part, the conformance of plant operations to provisions contained within the TSs and applicable license conditions at least once per 12 months.

The inspector reviewed the most recent Quality Assurance (QA) audit of Health Physics (HP) and Radiation Protection, Audit No. OP02-93/35, performed since the last NRC inspection conducted September 20-24, 1993, and documented in IR 93-22. The inspector noted that the audit was conducted during the third Unit 2 refueling outage (2R3), and was well-planned and documented. The audit adequately assessed the program, and contained substantive items and comments.

The inspector reviewed the licensee's to-date planning for an audit scheduled in April 1994, focusing on the implementation of revised 10 CFR Part 20. It appeared that all of the significant portions of the revision were to be addressed and no concerns were noted.

The inspector reviewed the licensee's plant-wide self-assessment program for identifying programmatic issues. The Deficiency Card (DC) program was open to any employee who identified a potential problem/incident. The inspector verified that no significant HP-related DCs were generated since the last inspection.

The inspector also reviewed selected Radiological Incident Reports (RIRs) initiated during 1993 and 1994 to date. The inspector noted that 19 RIRs were written in 1993 and one had been written in 1994 to date. During review of RIRs, the inspector noted thorough investigations, root cause analyses, appropriate and comprehensive corrective actions, and good communication among the management personnel concerned.

No violations or deviations were identified.

4. External Exposure Control (83750)

a. Whole Body Exposure

10 CFR 20.1201(a) requires each licensee to control the occupational dose to individual adults, except for planned special exposures under 20.1206, to the following dose limits:

- (1) An annual limit, which is the more limiting of:
 - (i) The total effective dose equivalent being equal to 5 rems; or
 - (ii) The sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 50 rems;
- (2) The annual limits to the lens of the eye, to the skin, and to the extremities, which are:
 - (i) An eye dose equivalent of 15 rems; and
 - (ii) A shallow-dose equivalent of 50 rems to the skin or to any extremity.

The inspector discussed cumulative whole body exposures for plant and contractor employees. Licensee representatives indicated, and the inspector independently confirmed, that all whole body exposures assigned since the previous NRC inspection of this area were within 10 CFR Part 20 limits. In addition, dose to eyes, skin and extremities appeared satisfactory and well within regulatory limits. No concerns were noted.

The inspector reviewed and discussed an evaluation performed by the licensee concerning the possible use of digital alarming dosimeters (DADs) as the dosimeter of record. The inspector noted that the evaluation was thorough and well-founded, and that advantages as well as disadvantages to using the DAD as dosimeter of record were addressed. Recommendations were made, but licensee representatives indicated that, to date, there were no definite plans to use the DAD as dosimeter of record.

b. Personnel Dosimetry

10 CFR 20.1502(a) requires each licensee to monitor occupational exposure to radiation and supply and require the use of individual monitoring devices by:

- (1) Adults likely to receive, in one year from sources external to the body, a dose in excess of 10 percent of the limits in 10 CFR 20.1201(a);
- (2) Minors and declared pregnant women likely to receive, in one year for sources external to the body, a dose in excess of 10 percent of any of the applicable limits of 10 CFR 20.1207 or 10 CFR 20.1208; and
- (3) Individuals entering a high or very high radiation area.

The inspector discussed the licensee's use of DADs, which continued to be an integral part of access control into the radiologically controlled area (RCA). DADs were used for all entries into the RCA with alarm setpoints for dose rate and integrated dose established according to the RWP requirements and the work to be performed. Site collective DAD dose was accumulated and tracked by a computerized system and compared to the site collective thermoluminescent dosimeter (TLD) (official dose) after the TLDs were processed. Generally, there was a correlation of approximately 97 percent between the TLDs and DADs.

The inspector noted that the licensee had upgraded their DAD equipment, and utilized equipment features such as histograms and teledosimetry in their day-to-day and outage activities. The inspector specifically discussed the effects of magnetism on DADs with licensee personnel and noted that the licensee was well aware of the limitations of the DADs associated with magnetism.

During tours of the plant, the inspector observed workers wearing appropriate personnel monitoring devices. No problems were noted with use, maintenance, or calibration of the DADs or with the DAD access control system in general.

c. Declared Pregnant Women and Embryo/Fetus Dose (83750, TI 2515/123)

10 CFR 20.1208 specifies the dose and dose rate to an embryo/fetus during the entire pregnancy due to occupational exposure of a declared pregnant woman. A "declared pregnant woman" (DPW) and "embryo/fetus" is defined in 10 CFR 20.1003.

The inspector reviewed the licensee's procedures and policies for implementing the requirements of 10 CFR 20.1208. Specifically, Step 4.1.2 of Licensee Procedure 00920-C, "Exposure limits and Administrative Guidelines," Rev. 11, dated December 23, 1993, addressed the requirements of 10 CFR 20.1208. Figure 1 of 00920-C provided an example of the "Declaration of Pregnancy" form and specified that the declaration was voluntary as required in 10 CFR 20.1003. In addition, the licensee published and distributed a pamphlet on the major changes to 10 CFR Part 20, Standards for Protection Against Radiation, which discussed the dose limits for the DPW and embryo/fetus, the voluntary nature for declaration of pregnancy, procedures for declaration, and responsibilities of the DPW and her supervisor.

The inspector also reviewed the licensee's training program with regard to the requirements specified in 10 CFR 20.1208, including lesson plans, examinations, and training records. Formal training was provided in General Employee Training (GET): "Radiation Protection- Exposure Control," GE-LP-00105-C, Rev. 6, dated December 30, 1993. The lesson plan specified that all personnel working in or frequenting any portion of the RCA will receive training on Regulatory Guide 8.13, Instruction Concerning Prenatal Radiation Exposure, and will acknowledge in writing their understanding of the instruction. Acknowledgement is indicated by signing the "Acknowledgement of Training in Radiological Health and Safety Matters" form which was not a part of any specific procedure. The inspector selectively reviewed 1993 training records to verify that licensee employees received this portion of GET. Informal training was also provided in GET: "Annual Badge Retraining/Self-Study Training," GE-LP-00116-25-C, Rev. 25, which addressed prenatal risks and protection of the embryo/fetus. In addition, the licensee provided similar information in the Handbook for General Employee Badge Training, dated January 1, 1994.

Although the licensee had no DPW at the facility since January 1, 1994, the inspector did review the licensee's program and procedures for DPW dose assessments. Uniform distribution of dose to the DPW as required by 10 CFR 20.1208(b) was also specified in 00920-C, Figure 1, Footnotes 5 and 6. However, at

the time of this inspection, the inspector noted that the licensee's automated Health Physics Information System (HIS) only tracked the DPW total dose (500 mrem - 200 mrem (buffer dose) = 300 mrem (administrative limit)) and not the uniform dose rate of 50 mrem/month. The inspector discussed this discrepancy with licensee representatives and the problem was immediately corrected by adjusting the HIS parameters so that the program would automatically place an administrative hold at 50 mrem in one month for a DPW. The licensee also added additional dose margins to ensure the DPW would not exceed 50 mrem/month. A memo dated March 31, 1994 from the HP Supervisor to the dosimetry specialists was written to describe and implement this additional dose limit for the DPW. The inspector had no further questions.

In the areas reviewed, there were no violations or deviations identified and the inspector determined that the licensee had established adequate policies and procedures for implementing the requirements of 10 CFR 20.1208.

d. Planned Special Exposures (83750, TI 2515/123)

The requirements pertaining to Planned Special Exposures (PSEs) are specified in 10 CFR 20.1201(b), 20.1206, 20.2104(b), 20.2104(e)(2), 20.2105, 20.2106, 20.2202(e), and 20.2204. Regulatory Guide 8.35, Planned Special Exposures, dated June 1992, provided guidance on the conditions and prerequisites for permitting PSEs allowed by the revision to 10 CFR Part 20, the associated specific monitoring and reporting requirements, and examples of acceptable means of satisfying these requirements.

The inspector determined that the licensee had a policy for allowing PSEs and reviewed the licensee's program and procedures regarding them. Since the licensee implemented the revision to 10 CFR Part 20 on January 1, 1994, there have been no PSEs. The inspector reviewed the following procedures pertaining to the permitting, monitoring, and reporting of PSEs:

- 00920-C, "Radiation Exposure Limits and Administrative Guidelines," Rev. 11, dated December 23, 1993;
- 45012-C, "Individual Radiation Exposure Records and Reports," Rev. 10, dated March 11, 1994; and
- 00152-C, "Federal and State Reporting Requirements," Rev. 16, dated December 23, 1993.

The inspector verified that licensee procedure 00920-C for approval of PSEs included provisions for: (1) ensuring that PSEs were to be used only in exceptional situations as specified in 10 CFR 20.1206(a); (2) designation of the Executive Vice President who was delegated the authority to authorize a PSE; (3) informing and instructing the individuals involved in accordance with

10 CFR 20.1206(c); (4) ensuring that the determination of prior dose in accordance with 10 CFR 20.2104(b) and 20.2104(e)(2) are met for individuals who are permitted to participate in PSEs; (5) ensuring that the PSE limits of 10 CFR 20.1206(e) subject to 10 CFR 20.1201(b) are met; and (6) ensuring that individual doses resulting from PSEs are recorded and reported to individuals involved in the PSE within 30 days from the date of the PSE in accordance with 10 CFR 20.1206(g).

The inspector did note some inadvertent omissions in the procedures with regard to the reporting requirements for PSEs. Although procedure 00920-C acknowledged the reporting requirements of 10 CFR 20.2204, the responsibilities for report preparation, review, approval, and submittal as prescribed in procedure 00152-C did not address the reporting requirements for PSEs, specifically 10 CFR 20.1206(f), 20.2202(c), and 20.2204. In addition, the inspector noted that procedure 45012-C did not address the reporting requirements of 10 CFR 20.1206(g). The inspector discussed these omissions with licensee representatives and indicated to the licensee that this matter would be tracked as an inspector followup item (IFI 50-424, 50-425/94-08-01).

In the areas reviewed, there were no violations or deviations identified and the inspector determined that the licensee had established adequate policies and procedures for PSEs.

e. High and Very High Radiation Areas (83750, TI 2515/123)

TS 6.11.1 requires, in part, that in lieu of the "control device" or "alarm signal" required by 10 CFR 20.1601(a), each high radiation area in which the intensity of radiation is greater than 100 mrem/hour but less than 1,000 mrem/hour at 30 cm (12 in.) from the radiation source or from the surface which the radiation penetrates shall be barricaded and conspicuously posted as a high radiation area and entrance thereto shall be controlled by requiring issuance of an RWP. Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

- (1) A radiation monitoring device which continuously indicates the radiation dose rate in the area; or
- (2) A radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate levels in the area have been established and personnel have been made knowledgeable of them; or
- (3) An individual qualified in radiation protection procedures with a radiation dose rate monitoring device, who is responsible for providing positive control over the

activities within the area and shall perform periodic radiation surveillance at the frequency specified by the HP Superintendent in the RWP.

TS 6.11.2 requires additional controls for areas accessible to personnel with radiation levels greater than 1,000 mrem/hour at 30 cm (12 in.), including locked doors, controlled keys, and flashing lights.

(1) Training and Qualifications of Personnel

10 CFR 19.12 requires, in part, that the licensee instruct all individuals working in or frequenting any portions of the restricted area in the health protection aspects associated with exposure to radioactive material or radiation; in precautions or procedures to minimize exposure; in the purpose and function of protection devices employed; in the applicable provisions of the Commission regulations; in the individual's responsibilities; and in the availability of radiation exposure data.

The inspector reviewed selected portions of the licensee's radiation protection training program to determine whether workers have been instructed in the relevant provisions of 10 CFR 20.1001-20.2402 consistent with the requirements of 10 CFR 19.12. This assessment included a review of applicable lesson plans, examinations, and video tapes. Specifically, the inspector reviewed the licensee's GET and continuing training programs with regard to high radiation area (HRA) and very high radiation area (VHRA) hazards, access control procedures, postings, proper work practices, and radiation workers' responsibilities with respect to such areas. The following training materials were reviewed:

- GE-001 Examination -January, February, and March 1994 (100 questions, 70% = passing grade);
- Handbook for General Employee Badge Training, Rev. 21, dated January 1, 1994;
- Continuing Training: HP-LP-93201, "Procedures," Rev. 0, dated October 28, 1993;
- GET: GE-LP-00116-25-C, "Annual Badge Retraining/Self-Study Training," Rev. 25, dated March 11, 1994;
- GET: GE-LP-00105-C, "Radiation Protection- Exposure Control," Rev. 6, dated December 30, 1993;

- GET: GE-LP-00108-C, "Radiation Protection-Access Control," Rev. 8, dated December 30, 1993; and
- 10 CFR Part 20 Limits and Definitions Changes (video).

Selected training records were reviewed to verify that individuals successfully completed the course work and passed the applicable examinations. Based on the review of the lesson plans and other training materials noted above, the inspector ascertained that this aspect of the training program adequately covered the access control requirements specified in 10 CFR 20.1601 and 20.1602.

(2) Procedures

The inspector reviewed the following procedures for HRA and VHRA characterization, control and access:

- 00937-C, "Radiation and Contamination Control," Rev. 10, dated December 23, 1993; and
- 00008-C, "Plant Lock and Key Control," Rev. 11, dated December 23, 1993.

The inspector noted that the procedures listed above were consistent with 10 CFR 20.1601 and 20.1602 requirements and addressed transient HRAs and VHRAs.

(3) Facility Tours

During tours of the RCA, the inspector observed the implementation of posting and access controls for various radiation areas (RAs), high radiation areas (HRAs), and very high radiation areas (VHRAs). For the areas observed, all HRAs and VHRAs were properly posted and controlled. Selective review of key checkout logs and observation of the checkout/return procedure by HP personnel confirmed that HRA and VHRA keys were properly controlled. HP supervisors reviewed key logs frequently, inventoried keys as required, and took appropriate actions when a key was discovered missing or unaccounted for.

The inspector noted that a separate set of DADs were maintained and issued for entry into HRAs. These DADs were a different color to distinguish them easily from the routinely issued DADs. HP escorts accompanied on specialized jobs, but most HRA entries were routine in nature (i.e. Operations verifications), and were performed as allowed by TS 6.11.1.b noted above. Individuals

requesting entry were briefed on the appropriate RWP, issued one of the HRA DADs, and made knowledgeable of the dose rates in the area.

No violations or deviations were identified.

5. Internal Exposure Control (83750, TI 2515/123)

a. Maintaining Total Effective Dose Equivalent As Low As Reasonably Achievable (TEDE/ALARA)

The inspector reviewed the licensee's training program, policy, and procedures to initiate the implementation of 10 CFR 20.1702, Use of Other Controls, focusing on the requirement to maintain worker dose TEDE/ALARA while performing work in airborne radioactive material areas (ARMAs).

The licensee had initiated the process of changing from a high level of respirator usage (mainly to avoid facial contaminations) to an environment where respirators would be relied on less frequently during the preoutage briefings for refueling outages 1R4 and 2R3. Both of the aforementioned outages occurred in 1993. Although the licensee had not implemented the revised 10 CFR 20 requirements until January 1, 1994, limited use of respirators was demonstrated for selected jobs during the 1993 outages with some success. The preoutage briefings were conducted by the HP staff and provided to maintenance and craft personnel to orient the workers to the changes being made regarding internal exposure due to the revisions in 10 CFR Part 20. The briefings resembled training sessions and attendees were encouraged to ask questions and voice concerns over any HP issues. The inspector reviewed the outlines and presentations provided to craft and maintenance personnel during the preoutage briefings. It was noted that the licensee explained the decision-making process as to whether or not respiratory protection equipment would be used on a particular job and that the TEDE to the worker must be demonstrated to be ALARA. In addition, the licensee discussed the following topics: (1) increased use of engineering controls such as portable high efficiency particulate air (HEPA) filtration units and contamination containments to minimize ARMAs; (2) comparisons between internal dose prevented by use of respirator and the additional external dose received because of the increase in stay time in the area due to respirator usage; (3) increased use of face shields to minimize facial contamination events; and (4) the concept that TEDE/ALARA evaluations may result in a task being performed with a planned intake while the TEDE is maintained ALARA. The disadvantages of respirator use were also addressed. The disadvantages included the following: loss of productivity, worker anxiety, decreased communication, limited vision, increased heat stress, and general discomfort.

The inspector interviewed maintenance and craft personnel, including electricians, mechanics, and a maintenance foreman regarding the TEDE/ALARA concept. In general, the individuals interviewed demonstrated an acceptable level of knowledge of the TEDE/ALARA policy and procedures. Worker acceptance and support of a reduction in the use of respirators was limited mainly due to the concept of committed effective dose and the individual having less control over his/her internal exposures and there by relying on management to minimize his/her internal dose. The inspector discussed this with the HP staff and it was noted that the licensee would continue to provide TEDE/ALARA briefings for plant workers.

The inspector also reviewed the following procedures pertaining to respiratory protection and TEDE/ALARA:

- 00970-C, "Respiratory Protection Program," Rev. 6, dated December 23, 1993; and
- 47001-C, "Selection and Use of Respiratory Protection Equipment," Rev. 9, dated January 1, 1994.

The inspector verified that the application of process and engineering controls for routine operations was addressed in the procedures. In addition, it was noted that protective measures for non-routine operations consistent with maintaining TEDE/ALARA were also addressed.

Based on discussions of selected plant workers and HP personnel, and a review of procedures, the inspector concluded that the licensee had effectively started the process for change and was making reasonable progress towards worker acceptance for a general re-evaluation of its respiratory protection program.

No violations or deviations were identified.

b. Internal Dose Assessments

10 CFR 20.1204 specifies that, for the purpose of assessing dose used to determine compliance with occupational dose equivalent limits, the licensee, when required to monitor internal exposure, shall take suitable and timely measurements of concentrations of radioactive materials in air, quantities of radionuclides in the body, quantities of radionuclides excreted from the body, or combinations of these measurements. When specific information on the behavior of the material in the individual is known, that information may be used to calculate the committed effective dose equivalent (CEDE).

The inspector reviewed the licensee's program for monitoring internal dose. Based on historical plant data, the licensee determined that it would be unlikely that plant workers at the

licensee's facility would exceed ten percent of the annual intake limits (ALIs) during routine operations; therefore, the requirements of 10 CFR 20.1502(b) for internal exposure monitoring would not be applicable. Although the licensee did not track derived air concentration-hours (DAC-hrs) for individuals, periodic and special monitoring for internal radioactivity through the whole body analysis and bioassay program was required. Procedure 44002-C, "In-Vivo Bioassay and Internal Dose Assessment," Rev. 10, dated March 11, 1994, requires initial and termination bioassays; and special bioassays whenever an intake is suspected. For a planned intake, a special or routine whole body count (WBC) less than 10 total ALI percentages (TAP) would not require any further action as long as the worker can clear the personnel contamination monitors (PCMs). For a special or routine WBC that is greater than 10 TAP, procedure 44002-C required the following: (1) inform HP supervision; (2) perform investigation WBC to verify the results; (3) evaluate radionuclides identified; (4) schedule WBC for other workers involved in the same job; (5) determine quantity of intake and estimate internal dose; (6) estimate the DAC-hrs equivalent exposure; (7) assess worker restrictions; (8) consider need for in-vitro samples and analyses; (9) place individual on an appropriate re-count frequency; (10) determine root cause and identify corrective actions to prevent recurrence; and (11) answer questions the worker may have. For WBC results greater than 25 TAP, the procedure requires that the above tasks be performed in addition to collecting excreta samples; performing additional dose and bioassay assessment; and providing notification to the individual's supervisor, general manager, and corporate office.

The inspector reviewed the licensee's records for internal dose assessments made since January 1, 1994 and noted that a technician working on a Waste Monitor Tank (WMT) on January 28, 1994, had a facial contamination and received an intake of Co-60, Co-58, and Mn-54. Based on whole body count results, the licensee calculated the CEDE for the three radionuclides noted above to be 15.05 mrem. The dose assessment was stored in the individual's file. However, since the licensee was not required to calculate the CEDE in accordance with 10 CFR 20.1204, the calculated internal doses were not assigned to the individual and added to the individual's external exposure record in order to obtain the TEDE.

Based on the above evaluation, the inspector concluded that the licensee's program for monitoring, assessing, and controlling internal exposures was conducted in accordance with regulatory and procedural requirements.

No violations or deviations were identified.

6. Surveys, Monitoring, and Control of Radioactive Material (83750)

a. Surveys

10 CFR 20.1501(a) requires each licensee to make or cause to be made such surveys as (1) may be necessary for the licensee to comply with the regulations and (2) are reasonable under the circumstances to evaluate the extent of radioactive hazards that may be present.

The inspector reviewed selected records of radiation and contamination surveys performed during 1993 and 1994, and discussed the survey results with licensee representatives. Also, during tours of the plant, the inspector observed HP technicians performing radiation and contamination surveys. No concerns were identified. The licensee had made some changes to the routine survey program based on an internal evaluation of the program. The inspector reviewed the evaluation and found it to be well-founded and detailed. Overall, changes were made such that survey frequencies were more commensurate with the work performed in the area. For example, infrequently entered areas were surveyed on a prior-to-entry basis, and contaminated areas were not entered and surveyed as often unless work was to take place subsequent to the entry. Survey frequencies of traffic areas and other areas routinely entered remained unchanged. The changes saved significant amounts of time, resources, and dose for HP personnel, but did not compromise the safety of the plant workers or the public.

b. Posting and Labeling

10 CFR 19.11(a) and (b) require, in part, that the licensee post current copies of 10 CFR Parts 19 and 20, the license, license conditions, documents incorporated into the license, license amendments and operating procedures, or that a licensee post a notice describing these documents and where they may be examined.

10 CFR 19.11(d) requires that a licensee post Form NRC-3, Notice to Employees. Sufficient copies of the required forms are to be posted to permit licensee workers to observe them on the way to or from licensed activity locations.

During the inspection, the inspector verified that Form NRC-3 was posted properly at various plant locations permitting adequate worker access. In addition, notices were posted referencing the location where the regulations, license, procedures, and supporting documents could be reviewed.

10 CFR 20.1904(a) requires the licensee to ensure that each container of licensed material bears a durable, clearly visible label bearing the radiation symbol and the words "Caution, Radioactive Material," or "Danger, Radioactive Material." The

label must also provide sufficient information (such as radionuclides present, and the estimate of the quantity of radioactivity, the kinds of materials and mass enrichment) to permit individuals handling or using the containers, to take precautions to avoid or minimize exposures.

During tours of the plant and selected outside radioactive material storage areas, the inspector noted that the licensee's posting and control of radiation areas, high radiation areas, airborne radioactivity areas, contamination areas, and radioactive material areas was satisfactory. The inspector also noted radioactive material was properly labeled. No concerns were noted.

c. Contaminated Area

The licensee's RCA total area equaled approximately 450,000 square feet (ft²). The licensee typically maintained less than 4,500 ft² (one percent) as contaminated area. The amount of contaminated area peaked in 1993 during the 2R3 outage at approximately three percent of the RCA. In general, housekeeping was considered satisfactory. No concerns were noted.

d. Personnel Contamination

The inspector reviewed the licensee's personnel contamination events (PCEs) for 1993 and 1994 to date. PCEs were documented and recorded if the contamination was greater than 1,000 disintegrations per minute (dpm), or greater than 100 net counts per minute (ncpm). In 1993, 237 PCEs were recorded. The licensee set target goals and tracked separately PCEs which involved a skindose greater than five millirem or the forfeiture of personal clothing, and hence termed those PCEs "reportable." Of the 237 PCEs recorded in 1993, 62 were "reportable," versus a "reportable" PCE goal of 43. As of the time of the inspection, 11 PCEs were recorded in 1994 with two "reportable." The licensee's current Systematic Assessment of Licensee Performance (SALP) period, January 3, 1993 to July 2, 1994, had a "reportable" PCE goal of 46, but 64 were documented at the time of inspection. The PCEs goal was exceeded due to more PCEs during the 2R3 outage than anticipated. The increased number was not excessive and no adverse trends were noted regarding the increase. Skin contaminations were assessed appropriately, and individuals were whole body counted and their internal dose calculated as required. Calculated skindoses resulting from PCEs were far below regulatory limits and no problems were noted with the licensee's methods or procedures.

e. Radiation Work Permits

The inspector reviewed Radiation Work Permits (RWPs) for adequacy of the radiation protection requirements based on work scope, location, and conditions. For the RWPs reviewed, the inspector noted that appropriate protective clothing, respiratory protection, and dosimetry were required. All workers entering the RCA were advised of their available exposure for that entry based on the RWP, as indicated by the access control system.

The inspector observed work being conducted under RWP No. 94-0114, which was used for resin sluicing and moving the fill head between high integrity containers (HICs) used for storing spent resins. The inspector attended the ALARA pre-job briefing and noted that the job involved a radwaste operator and an HP technician donning protective clothing, accessing the top of the HICs and moving the fill head from one HIC to another. The radwaste operator would move the fill head and the HP would monitor the dose rates and assist with glove changes, etc. The radwaste operator's DAD was given alarm settings of 200 millirem integrated dose and 3,000 millirem per hour dose rate, based on historical records of similar jobs. In addition to his DAD and normal TLD, the radwaste operator was provided with finger TLDs and a lapel breathing zone sampler. Based on historical records, the decision was made to relocate the radwaste operator's whole body dosimetry (DAD and TLD) to the upper right arm to monitor the portion of the whole body nearest the anticipated maximum dose rates. DADs for support personnel, as well as the inspector's, were set for 25 millirem dose and 100 millirem per hour dose rate alarms. The inspector found the pre-briefing to be worthwhile and helpful for all involved, and noted that it also included review of related industry events.

The inspector observed the job as it was performed and noted no significant concerns. The job was completed without incident and with doses well within projections. Air samples taken during the job were less than the minimum detectable activity. The radwaste operator, HP technician, and inspector received DAD doses of 40, nine, and one millirem, respectively. A post-job debriefing was conducted and comments/suggestions were documented for future reference.

Overall, the inspector found the licensee's program for RWP implementation to adequately address radiological protection concerns, and to provide for proper control measures.

No violations or deviations were identified.

7. Radiation Detection and Survey Instrumentation (83750)

During facility tours, the inspector noted that survey instrumentation and continuous air monitors in use within the RCA were operable and displayed current calibration stickers. The inspector further noted an adequate number of survey instruments were available for use, and background radiation levels at personnel survey locations were observed to be within the licensee's procedural limits. DADs were also noted to be calibrated as required. In general, Operations, Maintenance, etc. personnel were not issued survey instruments for field use. Typically, only HP personnel were allowed to use survey instruments, but other personnel could be issued survey instruments if they had completed specific training in working with and using them. No concerns were noted.

No violations or deviations were identified.

8. Program for Maintaining Exposures As Low As Reasonably Achievable (ALARA) (83750)

10 CFR 20.1101(b) requires that the licensee shall use, to the extent practicable, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are As Low As Reasonably Achievable (ALARA).

The inspector reviewed the licensee's program to maintain the site collective dose ALARA. During discussions with licensee representatives, the inspector was informed that the 1993 site dose was 366 person-rem. The licensee's site dose goal for 1993 was 530 person-rem. The licensee's site dose goal for 1994 was set at 243 person-rem, the majority of which accounted for one refueling outage planned during the year. The 1994 site dose as of March 15 was approximately six person-rem, as compared to a year-to-date dose goal of 15 person-rem. The licensee's current SALP period, January 3, 1993 to July 2, 1994, had a site dose goal of 557 person-rem. Through February 1994, the site dose for that period was 370 person-rem, and it appeared that the licensee would easily meet the SALP period goal.

The inspector reviewed and discussed with licensee representatives successful ALARA initiatives and reviewed the licensee's long term radiation exposure reduction projects. The ALARA initiatives reviewed included the following:

- (1) Modified reactor coolant chemistry- Since startup, modified reactor coolant chemistry had saved approximately 66 person-rem per outage per unit according to Electric Power Research Institute (EPRI) data;
- (2) Controlled shutdown (early boration and hydrogen peroxide addition)- Licensee management had committed to reduce the reactor coolant system (RCS) source term via controlled shutdown and

chemical cleanup with two reactor coolant pumps running and maximum letdown. This source term reduction technique was responsible for significantly reducing dose rates on RCS piping in both units; and

- (3) Reactor coolant system micro-filtration- The 25 micron nominal back flushable filter in the Unit 2 RCS was replaced by a cartridge type filter at 0.2 micron absolute. The removal of sub-micron particles will ultimately lower radiation levels, improve water clarity during refueling outages, decrease reactor coolant pump seal wear, and reduce hot particle incidents. This modification is scheduled for Unit 1 on the RCS and spent fuel pool purification system during the IR5 refueling outage. Additional dose savings occur in this area due to the licensee's modifications and procedures allowing for remotely changing the cartridge filters. As a result, filters with contact dose rates of hundreds of rem/hour can be changed out and disposed of for a few dozen person-millirem. The inspector watched a videotape of the changeout technique and noted no problems or concerns.

Overall, the inspector concluded that the licensee's ALARA program was successful and effective in reducing source term and general area dose rates throughout the plant.

No violations or deviations were identified.

9. Exit Meeting

At the conclusion of the inspection on March 31, 1994, an exit meeting was held with those licensee representatives indicated in Paragraph 1. The inspector summarized the scope and findings of the inspection, including the IFI discussed in Paragraph 4.d. The licensee did not indicate any of the information provided to the inspectors during the inspection as proprietary in nature and no dissenting comments were received from the licensee.

<u>Item No.</u>	<u>Status</u>	<u>Description and Reference</u>
50-424, 425/94-08-01	Open	IFI - Procedure addressing PSEs under 10 CFR Part 20 was lacking with regard to reporting requirements (Paragraph 4.d).

DOCKET FILE

T-5C3