Gillow

JUN 25 1984

Tennessee Valley Authority
ATTN: Mr. H. G. Parris
Manager of Power and Engineering
500A Chestnut Street Tower II
Chattanooga, TN 37401

Gentlemen:

SUBJECT: REPORT NOS. 50-390/84-44 AND 50-391/84-37

On June 4 - 8, 1984, NRC inspected activities authorized by NRC Construction Permit Nos. CPPR-91 and CPPR-92 for your Watts Bar facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed inspection 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 the enclosures will be placed in NRC's Public Document Room unless you notify this office by telephone within 10 days of the date of this letter and submit written application to withhold information contained therein within 30 days of the date of the letter. Such application must be consistent with the requirements of 2.790(b)(1).

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

Sincerely,

/S/

David M. Verrelli, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Enclosure:
Inspection Report Nos. 50-390/84-44
and 50-391/84-37

cc w/encl: (See page 2)

IE01

cc w/encl:
T. G. Campbell, Watts Bar Nuclear
Plant Site Director
W. T. Cottle, Plant Manager
J. W. Anderson, Manager
Office of Quality Assurance
H. N. Culver, Chief, Nuclear Safety Staff
R. Pierce, Watts Bar Nuclear Plant
Project Manager
D. L. Williams, Jr., Supervisor
Licensing Section
R. E. Teamer, Project Engineer
G. Wadewitz, Construction Project
Manager

bcc w/encl:
NRC Resident Inspector
Document Control Desk
State of Tennessee

RII WRoss:sa 06/22/84 | RII JJBlake 06/22/84 | RII ARHerdt 06/22/84 | RII DMVerrelli 06/25/84

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*W. T. Cottle, Plant Manager
*M. K. Jones, Engineering Supervisor
F. Heacker, Chemistry Unit Supervisor
*S. Casteel, Chemical Engineer
R. Matthews, Chemical Engineer
H. Nall, Chemistry Laboratory Supervisor
G. Denton, Assistant Operations Supervisor
H. Voiles, Training Shift Engineer
D. McConnell, Operations Shift Supervisor
R. Griffin, Mechanical Unit Supervisor
G. Johnson, Mechanical Engineer

Other licensee employees included six technicians and four operators.

NRC Resident Inspectors

*M. B. Shymlock
*W. E. Holland

*Attended exit interview.

2. Exit Interview

The inspection scope and findings were summarized on June 8, 1984, with those persons indicated in paragraph 1 above. The licensee acknolwedged the inspection results with no dissenting comments.

Inspector Followup Item 50-390/84-44-01, Verification of Construction of New Secondary Water Chemistry Laboratory

Inspector Followup Item 50-390/84-44-02, Verification of Completion of Modified Steam Generator Blowdown Recovery System

Inspector Followup Item 50-390/84-44-03, Verification of Completion of Preoperational Activities Related to the Condensate Cleanup System

Inspector Followup Item 50-390/84-44-04, Verification of Completion of Preoperational Activities Related to Inline Analytical Instrumentation

Inspector Followup Item 50-390/84-44-05, Verification of Completion of Revision of Instructions and Procedures

Inspector Followup Item 50-390/84-44-06, Improvement of Procedures for Initiating Corrective Action Based on Abnormal Chemistry Conditions

Inspector Followup Item 50-390/84-44-07, Verification of Administrative and Technical Procedures for Implementing the Proposed IST Program for Pumps and Valves

Inspector Followup Item 50-390/84-44-08, Verification of Acceptable Procedures for Testing Diaphragm Valves

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved Items were not identified during this inspection.

5. Plant Water chemistry (92706)

This inspection consisted of the following interrelated efforts:

- Assessment of the capability of the major components of the secondary water cycle to protect the primary pressure boundary by ensuring the absence of corrosive environments in the steam generator,
- Assessment of the adequacy of the licensee's water chemistry program to monitor the quality of water in the primary and secondary water systems, and
- Assessment of the ability of the licensee to control the quality of water in the plant through implementation of the water chemistry program.

a. Assessment of the Design of Components in the Secondary Water System

At the time of this inspection, both Watts Bar units were in the construction stage. The licensee had performed hot functional testing of Unit 1 during the third quarter of 1983 and was preparing to repeat these tests in the summer of 1984. During this period, the steam generators of Unit 1 were in "wet layup" under conditions designed to prevent oxidation and corrosion.

The inspector compared the "as built" secondary water system of Unit 1 with the description that is in the licensee's Final Safety Analysis Report (FSAR), especially Section 10.3 "Main Steam Supply," and Section 10.4, "Other Features of the Steam and Power Conversion System." The inspector also interviewed cognizant plant personnel to establish what efforts had been made to maximize the effectiveness of the following components of the secondary water system:

(1) Main Condenser

The Watts Bar plant will transfer waste heat through a condenser to a closed-cycle cooling system that uses water from the Tennessee River to replace water lost through evaporation from two natural-draft cooling towers. Historically, the main condensor has been the principal path of contaminant entry (soluble ions, solids, and air) into the condensate/feedwater and subsequently into the steam generators.

The licensee is protecting the integrity of the components of the condenser (i.e., copper-nickel tubes and carbon-steel tubesheets) by chlorinating the circulating cooling water when its temperature exceeds 62°F, so as to prevent growth of marine organisms (especially asiatic clams).

The licensee is aware of the potential that copper may be transferred, through erosion or corrosion, from the condenser tubes to the condensate and ultimately could facilitate the formation of corrosive environments in the steam generator. Consequently, the licensee is planning to develop procedures to minimize oxidative conditions in the hotwell during plant operation and layup. The inspector was informed that the hotwell had been hydrolazed, and the lower portion currently appears to have a resistive coating of black iron oxide (magnetite). However, the upper part has a coating of red iron oxide (hematite or rust) that will continue to flake off and form suspended solids in the condensate or "crud" on the floor of the hotwell.

The inspector verified that the licensee has nine sample points on the hotwell for monitoring the cation conductivity of the condensate. Also, the quality of the condensate is monitored (continually and by grab samples) at the discharge of the hotwell pumps. Maximum limits are specified (for Modes 1-5) for the following chemical parameters: specific and cation conductivity, dissolved oxygen, sodium, and pH. The inspector considers that this monitoring program will provide an acceptable level of detection for inleakage of air circulating cooling water.

(2) Condensate Makeup Water

A second potential source of contamination of the condensate is the water added from the condensate storage tank as makeup. This makeup water is river water that has been purified in the plant's water treatment system through a series of settling tanks, charcoal absorbers, and ion-exchange resin beds and then degassified. This water treatment system has produced 750 gpm of high quality water for the last five years.

The product of the water treatment system is pumped to three storage tanks - the Condensate Storage Tank (CST), the Primary Water Storage Tank (PWST), and the Demineralized Water Storage Tank (DWST). Although the specifications on the quality of water (i.e., conductivity, silicon, and sodium) in these tanks are lower than those on the product of the water treatment plant, the water in the CST and the RWST is protected from further air inleakage by the use of an impermeable "bladder." The CST is also continually sparged with nitrogen to remove dissolved oxygen so that the water will be of the desired quality when used as suction for the auxiliary feedwater pumps. The water from the CST undergoes additional dearation when it is added to the water in the hotwell, so that the concentration of dissolved oxygen in the condensate remains below the allowable (3 ppb) limit. The residual dissolved oxygen in the RWST (~50 ppb) is reduced to the levels desired in the reactor coolant by the addition of hydrazine (during startup) or gaseous hydrogen (during operation of the plant).

The inspector considers the allowable maximum limits placed on the effluents of the various stages of the water treatment plant will provide a product of sufficiently high quality to ensure the specifications of the makeup water from the CST and PWST are also met.

(3) Startup/Cleanup Pre-Filters

The inspector observed that a battery of 12 Condensate Filter Vessels (CFVs) had been installed upstream of the condensate demineralizer polishers in Unit 1. The purpose of these cartridge filters is to remove suspended solids from the condensate; thereby reducing the fouling of the demineralizer resin beds and extending the useful life of these beds. Each CFV is designed for a flow of 750 gpm (2-3 gpm per square foot of filter medium). Therefore, the CFV battery can be used during startup or whenever the flow is less than ~ 9000 gpm (i.e., ~50% of flow at full power), but must be bypassed at higher flow rates. The licensee has not developed procedures for operating this filter battery; however, the inspector was informed that a CFV will be replaced whenever the ΔP across a vessel exceeds 10 psid or whenever the quality of the effluent is not acceptable. The battery was used during the 1983 hot functional tests and collected ~ 200 pounds of solids - principally iron oxides - from the condensate.

The inspector considered the use of prefilters to be advantageous to maintaining maximum effectiveness from the demineralizer resin beds. Procedures for operation, bypassing, and replacement of CFVs should be included in the plant's operating instructions.

(4) Condensate Cleanup System described in Section 10.4.6 of the FSAR is in place for Unit 1. This system consists of six drop-bed, mixed ion-exchange resin vessels with a regeneration system that will be common for both Watts Bar units. Five beds will suffice for cleanup during full condensate flow; consequently, one tank may be in the regeneration or stand-by mode. The inspector was informed that the polishers will be operated continually during plant operation rather than in the bypassed mode described in Section 10.4.6.2 and 10.4.7.1 of the FSAR. Limits on the concentrations of silica, sodium and sulfate, as well as conductivity, have been established in chemistry procedures for the effluent of the polishers. Likewise, additional specifications have been placed in operating procedures (SOI-14.1 and SOI-14.2) for iron copper, dissolved solids, suspended solids, and ΔP across a bed. Alarms on the local control panel are actuated by high readings (inline monitors) of silica, sodium, specific conductivity and ΔP.

During this inspection, the licensee was regenerating the resin beds and making the cleanup system ready for the upcoming hot functional tests. This was a coordinated effort of chemistry and operations personnel that will be discussed further in Section 5.e of this report.

(5) Condensate/Feedwater Train

The purified effluent from the condensate polishers flows through gland steam condensers and main feedwater pump turbine condenser and provides suction for three booster polisher pumps. The water is then pumped through three strings of low pressure heaters (nos. 7, 6, and 5), to the condensate booster pumps, and then through three strings of intermediate pressure heaters (nos. 4, 3, and 2) to the feedwater pumps. Finally, the condensate/feedwater is pumped through the no. 1 high-pressure feedwater heaters into the steam generators. The drains from the heaters can be cycled, through nos. 3 or 7 heater drain tank, either to waste or to the hotwell or forward to augment the flow of feedwater. All of the water and steam lines are potential sources of contamination that, during normal operation, would not be removed by the condensate cleanup system.

The licensee has taken several measures to minimize the contamination of feedwater in this portion of the secondary water cycle. First, the original copper-nickel tubes in all of the feedwater heaters and in the feedwater pump condenser have been replaced with stainless steel tubes to minimize the transport of copper into the steam generator. During this retubing process, the feedwater heaters were layed up dry to reduce the formation of hematite on the inner surfaces. Second, procedures for startup are being developed to include "short" and "long" cleanup cycles during which the condensate/feedwater train will be flushed with demineralized water until the chemical parameters of the feedwater meet the allowable specifications for power operation. Third, during startup, the cascading drains from the nos. 3 and 7 heater drain tanks will be cycled back to waste or to the hotwell until the quality of this water is high enough for the drains to be cycled forward to the feedwater line.

The inspector considers that these actions will ensure that the water pumped into the steam generators contains a minimum of iron or copper.

(6) Steam Generators

As the result of a modification program that was completed before the initial hot functional tests, the four steam generators in Unit 1 have improved capabilities for maintaining desirable layup conditions during outages and for feedwater flow and blowdown during plant operation. In addition, the licensee is planning, before fuel loading, to redesign the blowdown cleanup system through the addition of a two-bed demineralizer systems. This redesign will also allow the blowdown pipes to be enlarged from two to four inches; thereby increasing the blowdown capacity of each steam generator from 30 gpm to 200 gpm.

(7) Main Steam

The components of the main steam system are potential sources of contaminants, principally iron oxides. The inspector and the licensee discussed the need to provide lay-up protection to the carbon steel steam lines during extended outages to prevent the formation of large amounts of rust that would be transported to the hotwell during startup.

The licensee informed the inspector that the moisture separator reheaters have copper-nickel tubes and, thus, posted a potential source of copper in the condensate and in the drain water that is cycled to the feedwater, via the no. 3 feeder drain tank during plant operation.

The licensee continually measures the specific and cation conductivity of the steam to monitor carryover from the steam generator.

Summary

The licensee has used new knowledge related to chemical induced corrosion of steam generator components to modify the design of secondary water cycle from that given in the FSAR. The most significant positive and negative features of the Watts Bar design are as follows:

- The tubes in the main condenser are made from 90 - 10 copper-nickel alloy. Although this alloy is beneficial for protecting the inner tube surfaces from pitting and corrosion due to aquatic organisms (so is chlorination of the circulating cooling water), it provides a source of copper that may be transported from the shell side of the tubes to the internals of the steam generator.

- The newly-installed pre-filters will improve the capacity of the condensate polishers to cleanup the condensate.

- Replacement of copper-nickel alloy tubes in the feedwater heaters and feedwater turbine condenser eliminates the main source of copper down stream of the condensate polishers. However, the tubes in the moisture separator reheaters are still copper-nickel alloy.

- The modifications to be made on the blowdown cleanup system will upgrade the licensee's capability to maintain the desired quality of water in the steam generator.

- The use of nitrogen to sparge air from the water in the CST will improve the quality of water added as condensate makeup.

- Maintaining the steam generators in wet layup with recirculation of the chemically treated water during layup maintain a protective magnetic coating on the carbon steel components of the steam generator.

The licensee has, therefore, taken several major steps to upgrade the original design of the secondary water system so as to ensure that the quality of water in the steam generators is very high and will minimize the formation of local corrosive environments that might lead to loss of integrity of the primary-secondary boundary. The licensee has analyzed the technical and economic costs and benefits associated with retubing the main condenser and moisture separator reheaters to eliminate potential corrosion problems attributable to copper, and has decided not to retube these components. Similarly, the licensee is aware that new structural

materials and designs of steam generator internals are now available that should further inhibit the formation of corrosion sites or electropotentials. However, backfitting the Watts Bar steam generators to take advantage of these improvements would require a major refitting program.

Other than the design changes listed above, no other variation between the "as built" plant (Unit 1) and the FSAR was observed by the inspector. The inspector considers that the secondary system has been designed and constructed to minimize the contamination of feedwater from the three principal pathways, i.e, inleakage, makeup, and transport of iron/copper oxides. Further protection must be provided by surveillance and control of the feedwater chemistry.

b. Water Chemistry Program

Technical Specifications are being developed that will set limits and surveillance requirements for key chemical parameters in the primary (reactor) coolant. These Technical Specifications will also require the licensee to develop and to implement a Secondary Water Chemistry Program that will provide protection to the primary-secondary pressure boundary and that will inhibit steam generator tube degradation. In the Watts Bar FSAR, specifically in Tables 10.3-2, 10.3-3, 10.3-4, and 10.4-1, the licensee has identified the key parameters and sample points to be monitored and the allowable limits for these parameters when the plant is in the following modes of operation: Cold Hydro, Cold Wet Layup, Hot Functional, Hot Shutdown, Hot Standby, Startup from Hot Standby, and Normal Power Operation.

The inspector observed that the development of a Water Chemistry Program that will meet the Technical Specification requirements is still underway although a definitive completion schedule was not available. The licensee informed the inspector that the program would be designed, in part, on the program being used at Sequoyah Nuclear Plant, in part on guidance provided by the TVA water quality improvement program, and on the guideline developed by the Steam Generator Owners Group (SGOG) and the Electric Power Research Institute (EPRI). A preliminary assessment of the licensee's progress is provided below.

(1) The licensee has established a Chemistry Section under the direction of a Chemistry Unit Supervisor (who reports to the Engineering Section Supervisor). All activities related to primary and secondary water systems are performed through coordination of a Laboratory Supervisor and chemical engineers who are under the supervision of the coordinators of Secondary and Auxiliary Water Systems and the Primary and Effluent Water Systems. The inspector was informed that the qualification of all personnel in the chemistry section were defined in Administrative or Section Instructions but he did not review these Instructions.

(2) The major elements of a chemistry manual has been developed as series of surveillance instructions (for Technical Specification requirements), Technical Instructions (identification of control, surveillance, and quality control measures as well as specific chemical procedures and procedures for data management), and Section Letters (scheduling tests, training, and other administrative guidance). The licensee has also developed a series of Startup Data Packages that establishes the chemical specifications that must be met during seven levels of startup tests.

(3) The licensee has equipped a single laboratory for performing all radiochemical and nonradiochemical activities. The laboratory also has sample taps for taking remote "grab" samples from selected locations of the secondary water system as well as displays of inline and analytical instrumentation located at key locations. The inspector was informed that, since this laboratory is located within the Protected Area of the plant while most of the secondary water system is outside the protected area, a new Secondary Water Chemistry Laboratory is to be constructed in the Turbine Building; i.e., outside the control point for the protected area. However, at this time there are no plans to display the in-line analytical instrumentation in the new laboratory. This will be disadvantageous since these meters and/or recorders must be read at least twice a shift and are valuable as continual monitors of short-term trends in key chemical variables in the secondary water system. The present laboratory will continue to be used for radiochemical analyses and non-radiochemical analyses of samples taken from the primary (reactor) water system. Most of these samples are taken in "hot sinks" that are located inside the protected area.

The water treatment plant and the condensate polishers are located in the same area of the Turbine Building and are monitored and controlled at local panels. These systems are operated on three shifts by two auxiliary operators under the supervision of an assistant unit operator (Operations Department).

<u>Summary</u>

Although the licensee's Water Chemistry Program has been developed to the extent that the Chemistry Section was able to perform its responsibilities during the 1983 hot functional tests, the inspector identified several areas where the program appears to be deficient. These deficiencies will be discussed in the next section.

c. Implementation of the Watts Bar Water Chemistry Program

The inspector also evaluated the completeness and acceptability of the licensee's Water Chemistry Program through discussions with plant personnel, review of written procedures and instructions, observation of test performances, and review of test results.

(1) Inasmuch as the Chemistry Section has been an operating entity for five to six years, the inspector observed that all activities were being performed in a professional manner. A staff of 26 chemistry technicians, divided into five shift crews, will perform all primary and secondary analyses. At present, these technicians, under the supervision of a Lead Shift Technician, are being trained to perform all Chemistry Procedures and Surveillance and Technical Instructions. Plans for changing this organization when the new Secondary Water Laboratory is built have not been established. The inspector established that the licensee has acceptable criteria for the qualifications of entrance-level technicians and has a formal program for training and qualifying technicians for increased levels of responsibility.

The licensee has established two groups of cognizant chemical engineers to work on all activities related to (a) Primary water chemistry and radwaste and (b) secondary and auxiliary systems chemistry. A lead cognizant engineer from each of these groups, together with the Laboratory Supervisor, report to the Chemistry Unit Supervisor. The inspector considers the role of the cognizant engineers to be valuable both for R and D purposes and for interaction with operations personnel who operate the Water Treatment and Condensate Polisher Systems. These engineers also review and evaluate daily, the control and surveillance data collected by the laboratory technician. The Laboratory Supervisor schedules the activities of the laboratory technician; however, his role in tracking and reviewing the test results was not clear.

(2) The inspector reviewed selected Technical Instructions and established that acceptable guidance and instructions have been developed for the following actions:

- identifying specific sampling points
- identifying appropriate sampling and analytical methods
- identifying sampling frequency
- identifying allowable limits for chemical parameters
- logging the results of tests

° calibrating instrumentation

These procedures and instructions are considered deficient to the extent they have not been completed for all modes of operation; i.e., wet layup and startup modes. The inspector was informed that the adequacy of written instructions is still under review.

(3) The inspector reviewed the procedures that have been developed by the Chemistry Section for use, by operations personnel, in the operation of the condensate polishers (SOI-14.1 and SOI-14.2). The inspector considers the assistant unit operator and auxiliary operators to be inadequately trained in these procedures. This deficiency is partially due to the fact that several of these operators received their scheduled instruction on this system before it was installed.

(4) The inspector reviewed the capability of the licensee to detect abnormal chemistry events and to trend short-term changes in chemical parameters. As discussed earlier, the existing chemical laboratory will have displays for observing current valves of key parameters (i.e., specific and cation conductivity, dissolved oxygen, hydrazine, pH, and sodium) at four important locations in the secondary system (hotwell pump discharge, condensate polisher effluent, and feedwater at two locations). During this inspection, most of these inline monitors were not in operation because water was not being cycled through the secondary system. It was the inspector's opinion, however, that the laboratory technicians were not adequately familiar with the display panels, maybe because they had not been used since the 1983 hot functional tests, and possibly because the identification of the displayed parameters was not clear for several meters/records.

The inspector was informed that selected data will be trended graphically by a cognizant engineer.

(5) The inspector established that the chemistry section has instructions and procedures that will ensure that test data are reviewed and interpreted and abnormal conditions are promptly reported to the Control Room operators by the Lead Shift Technician. The data is also reviewed daily (except during weekends) by a cognizant chemical engineer. The inspector was informed by operations personnel that, since there are no displays of chemical parameters in the Control Room other than an alarm related to operability of the condensate polisher, no action would be taken until an abnormal situation was reported by and discussed with the Chemistry Section. Corrective action would be taken on the basis of directions in Operation Procedure GOI-6 (Administrative Shutdown) for Technical Specification action requirements and Technical Instructions TI-16 (Plant System Sampling and

Chemical Criterion) and TI-19 (Chemical Fuel Control - Plant Systems) for Nontechnical Specification action requirements. Although the Control Room operators were cognizant of GOI-6, they were less familiar with the TIs because these instructions are not covered in operator licensing. This situation was discussed with plant management, and the inspector was informed that the TIs apply to all plant personnel.

<u>Summary</u>

The inspector recognized that the licensee has not completely developed all the elements of an acceptable Water Chemistry Program and is planning significant additions to the present laboratory. The following activities will be designated as Inspector Followup Items:

50-390/84-44-01, Verification of Construction of New Secondary Water Chemistry Laboratory

50-390/84-44-02, Verification of Completion of Modified Steam Generator Blowdown Recovery System

50-390/84-44-03, Verification of Completion of Preoperational Activities Related to the Condensate Cleanup System

(a. Procedures for the use of the Pre-Filter Battery)
(b. Training of Operators in the Operation and Regeneration of the Condensate Polishers)
(c. Bringing the Condensate Polished System to an Operable Condition)

50-390/84-44-04, Verification of Completion of Preoperational Activities Related to Inline Analytical Instrumentation

(a. Bringing the Displays to Operable Conditions)
(b. Training technicians in the Use of the Display Panel)

50-390/84-44-05, Verification of Completion of Revision of Instructions and Procedures

50-390/84-44-06, Improvement of Procedures for Initiating Corrective Action Based on Abnormal Chemistry Conditions

6. Inservice Testing of Pumps and Valves

Pursuant to 10 CFR Part 50.55a(g), the licensee must perform inservice tests to verify the operational readiness of pumps and valves whose function is required for safety and these tests shall comply with Section IX (Subsections IWP and IWV) of the applicable ASME Code. In May 1981, the licensee submitted for the NRC review a proposed program for testing pumps and valves that was based on the requirements of the 77S78 edition and addenda of the ASME Code. This program and associated requests for relief are currently under review by the Office of Nuclear Reactor Regulation. The inspector was informed by the licensee that the initial program is currently being revised to meet the requirements of the 80W81 edition and addenda of the ASME Code, as required by Section 50.55.a(g)(4)(i) of the referenced regulation.

The inspector was informed by the licensee that the scope of both the initial and revised programs is consistent with guidance that was provided in Draft Regulatory Guide 1.26. The inspector then discussed with the licensee a more recent, undocumented staff position that the operability of all pumps and valves that are "important to safety" should be verified periodically and future inspections would be based on the program approved by the Office of Nuclear Reactor Regulation. The inspector also reviewed the licensee's requests for relief from ASME Section IX requirements and discussed the NRC staff's positions relative to testing check valves, measuring the stroke time of solenoid valves, measuring the vibration and bearing temperature of pumps, and other tests that appear difficult to perform as required by the ASME code.

The inspector established that the licensee had set administrative limits on the leakage rate of containment isolation valves. These limits will be used as "a working guideline" in all analyses of leakages determined during the local leak rate tests performed pursuant to the Type C tests required by Appendix J of 10 CFR Part 50. The inspector also verified that the stroke times of valves had been established either from the stroke time specified in the Watts Bar Technical Specifications or FSAR, on the basis of a stroke time indirectly placed on a valve by a required response time limit, or on the size of the valve and the stroke time determined in a preoperational test.

The inspector was informed that vibration meters had been acquired that would meet the 5% accuracy required by the ASME Code.

The licensee informed the inspector that the design and configuration of the check valves in the Diesel Generator Raw Cooling Water System, prevented testing these check valves as required by IE Bulletin 83-03. The licensee will periodically disassemble these valves to verify their operability if no other test can be developed.

The inspector informed the licensee that two areas of review would be left as Inspector Followup Items:

50-390/84-44-07, Verification of Administrative and Technical Procedures for Implementing the Proposed IST Programs for Pumps and Valves

50-390/84-44-08, Verification of Acceptable Procedures for Testing Diaphragm Valves