



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

Report Nos.: 50-390/85-36 and 50-391/85-30

Licensee: Tennessee Valley Authority  
 500A Chestnut Street  
 Chattanooga, TN 37401

Docket Nos.: 50-390 and 50-391

License Nos.: CPPR-91 and CPPR-92

Facility Name: Watts Bar 1 and 2

Inspection Conducted: April 21 - May 20, 1985

Inspectors:	<u>A. J. Ignatonis</u>	<u>6/19/85</u>
	for M. B. Shymlock	Date Signed
	<u>A. J. Ignatonis</u>	<u>6/19/85</u>
	for W. E. Holland	Date Signed
	<u>A. J. Ignatonis</u>	<u>6/19/85</u>
	for C. W. Caldwell	Date Signed
Accompanying Inspector:	A. J. Ignatonis	
Approved by:	<u>S. P. Weise</u>	<u>6/19/85</u>
	S. P. Weise, Section Chief	Date Signed
	Division of Reactor Projects	

SUMMARY

Scope: This routine inspection entailed 334 resident inspector-hours on site in the areas of licensee actions on previous enforcement matters, unresolved items, followup on inspector identified items, followup on licensee identified items, fire prevention and protection, preoperational test program implementation verification, review and followup of safety evaluation report, independent inspection effort, testing of pipe support and restraint systems, TMI action items, IE Bulletin closeout, followup of IE Information Notices, comparison of as-built plant to FSAR description, followup of regional requests, and an information meeting with local officials.

Results: No violations or deviations were identified.

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## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

W. T. Cottle, Site Director  
R. M. Pierce, OEDC Project Manager for Watts Bar  
\*E. R. Ennis, Plant Manager  
G. Wadewitz, Construction Project Manager  
\*B. S. Willis, Operations and Engineering Superintendent  
\*H. B. Bounds, Maintenance Superintendent  
D. W. Wilson, Design Services Manager  
\*R. Norman, Jr., Operations Supervisor  
T. L. Howard, Quality Engineering Supervisor  
R. C. Miles, Modifications Manager  
C. E. Wood, Jr., Electrical Maintenance Supervisor  
\*M. K. Jones, Engineering Supervisor  
R. A. Beck, Health Physics Supervisor  
J. S. Woods, Instrument Maintenance Supervisor  
C. J. Nelson, Mechanical Maintenance Supervisor  
R. C. Sauer, Plant Compliance Supervisor  
W. L. Byrd, Preoperational Test Supervisor  
S. Johnson, Jr., Quality Manager - Construction  
\*T. W. Hayes, Nuclear Licensing Unit Supervisor  
L. C. Miller, Head, Plant Quality Engineering and Control Group  
H. L. Pope, Supervisor, Plant Quality Control Section  
L. J. Smith, Supervisor, Quality Surveillance Section  
\*R. T. McCollom, Plant Compliance Staff, Instrument Engineer  
R. E. Yarbrough, Jr., Assistant Operations Supervisor  
R. E. Bradley, Assistant Operations Supervisor  
\*F. A. Butcher, Project Engineer, PMO  
\*J. P. Mulkey, Supervisor, Technical Services  
\*J. R. Griggs, Compliance Engineer  
\*M. J. Burzynski, Regulatory Engineering Supervisor  
\*G. R. Ashley, Regulatory Engineer  
\*J. E. Gibbs, Site Services Manager  
\*G. R. Owens, Nuclear Engineer, Nuclear Licensing Section

Other licensee employees contacted included engineers, technicians, nuclear power supervisors, and construction supervisors.

\*Attended exit interview

## 2. Exit Interview

The inspection scope and findings were summarized on May 21 and June 4, 1985, with those persons indicated by an asterisk in paragraph 1 above. Two Unresolved Items\* (paragraphs 9.e and 15.C.4), concerning licensee review of a 10 CFR 50.55(e) item initially reported by Westinghouse, and acceptable battery performance testing were discussed in detail. In addition, the inspectors identified two Inspector Followup Items (paragraphs 14 and 15). The licensee acknowledged the inspection findings with no dissenting comments. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection. At no time during the inspection period did the inspectors provide written material to the licensee.

## 3. Licensee Action on Previous Enforcement Matters (92702)

(Closed) Unresolved Item 390/81-03-04, Justification for Residual Heat Removal (RHR) System Setpoints. The subject item was addressed in Inspection Report 390/83-06. The unresolved issue related to the ambiguous outputs from the Barton pressure transmitters in an accident environment resulting in a requirement to readjust the safety setpoints for the RHR isolation valves. Since the identification of this item, new pressure transmitters have been installed which eliminate this condition. The transmitter replacement issue is closed in this report, paragraph 5.a. The inspector verified that the setpoints listed in the vendor supplied setpoint document (PLS) and in Technical Specifications are correct and in agreement with design analyses of the systems. The inspector considers that all actions necessary to close this item have been accomplished.

Within the area inspected, no violations or deviations were identified.

## 4. Followup on Inspector Identified Items (92701)

- a. (Closed) IFI 390/84-37-06, Ventilation System Discrepancies. The inspector reviewed Maintenance Request (MR) A-485587 and Engineering Change Notice (ECN) 5146 which were issued to fix the electrical cable connection to valve PCV-65-83 and to correct deficiencies on schematic diagram 6.2.3.11 in the FSAR, respectively. The inspector verified that the MR and ECN were properly filled out and that actions required to correct the discrepancies were completed. One additional discrepancy was noted however, which is discussed in paragraph 14.
- b. (Closed) 390/84-82-04, Review of Technical Instruction (TI) TI-8 and 23. During the review of TI-23 Calculation of Estimated Critical Position it was noted that the procedure was quite complex. Several operators had difficulty accomplishing steps in this procedure. The licensee has issued TI-23.1, Estimated Critical Position (Short Form)

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\*Unresolved items are matters about which more information is requested to determine whether they are acceptable or may involve violations or deviations.

Revision 0 and revised TI-23. The purpose of this new TI is to present a simplified methodology for predicting the control rod position at which the reactor will achieve criticality. All licensed operators have been trained on this new TI.

TI-8, Shutdown Margin Calculation was also revised. Revision 5 was reviewed by the inspector. The licensee's action to develop the new procedure and revise the other procedures adequately addresses the inspector's concerns.

Within the area inspected, no violations or deviations were identified.

5. Followup on Licensee Identified Items (92700)

- a. (Closed) CDR 390/82-36, Ambiguous Outputs From Barton Pressure Transmitters In The Reactor Coolant System (RCS). The subject deficiency was identified during a Westinghouse review of requirements imposed on the RCS wide range pressure instrumentation. The review determined that existing hardware did not meet all current functional requirements; specifically, post-accident inaccuracy of the instrumentation was such that it could result in inappropriate operator actions, in particular with respect to termination of safety injection.

The corrective action defined by Westinghouse was the addition of new RCS wide-range pressure transmitters outside containment. TVA procured new pressure transmitters and prepared an Engineering Change Notice (ECN) 5512 to install this new instrumentation in the RCS. Work Plan (WP) 5134 was written to accomplish this work for Unit 1. The work was completed in April 1985.

The inspector reviewed ECN 5512, WP 5134 and performed a field inspection of the installed transmitters to verify completion of the work. The inspector also verified that the required calibration and functional testing had been accomplished in accordance with Surveillance Instruction 3.3.33. Also the inspector determined that emergency procedures had been revised to incorporate the new instrumentation requirements and that operators had received training on the changes. The inspector considers that all actions required to close this CDR for Unit 1 have been completed.

- b. (Closed) CDR 390/85-16, Redundant Tripping Devices for Containment Penetration Circuits not Provided. The subject deficiency identified that redundant tripping devices were not provided for control power circuits for valves FSV-43-251, 288, 310 and 319 as required by Regulatory Guide 1.63. In order to correct this condition, the licensee issued Engineering Change Notice (ECN) 5601 to install fuses in series with the breakers in the control power circuitry. The modification for Unit 1 was accomplished by Work Plan (WP) 5217 and completed on April 20, 1985.

The inspector reviewed ECN 5601, completed WP 5217 and the applicable wiring diagram (45N600-43-4, Rev. 4) and considers that all work necessary to close this CDR for Unit 1 has been completed.

- c. (Closed) CDR 390/85-14; 391/85-15, Series Mounted Smoke Dampers Do Not Meet Design Requirements. The subject deficiency identified four specific smoke dampers (O-XFD-31-92A, 92B, 78A and 78B) which were installed such that the required 3-hour rated compartmentation requirements were not met. TVA, in consultation with the vendor determined that the 3-hour compartmentation requirement can be met with the present dampers if the dampers are converted from smoke dampers to fire dampers. An Engineering Change Request (ECN) 5523 was prepared to accomplish the modifications. The work was accomplished in accordance with work plans (WB) 5148 and 5149. The work was completed in April 1985.

The inspector reviewed the ECN and the completed WPs and verified that the modifications had been completed. The inspector considers that all work necessary to close these CDRs has been accomplished.

Within this area inspected, no violations or deviations were identified.

#### 6. Fire Prevention and Fire Protection (42051C)

During plant tours, the inspectors conducted observations of fire prevention and protection activities in areas containing combustible materials where ignition of these materials could damage safety-related structures, systems or components. The observations included verification that applicable requirements of Administrative Instruction (AI) 9.9 (Torch Cutting, Welding, and Open Flame Work Permit), Standard Practice WB 12.6 (Fire Brigade Instructor's Guide and Fire Brigade Handbook), AI 1.8 (Plant Housekeeping) and WBNP Quality Control Instruction (QCI) 1.36 (Storage and Housekeeping) were being implemented with regard to fire prevention and protection.

Within this area inspected, no violations or deviations were identified.

#### 7. Preoperational Test Program Implementation Verification (71302)

The inspectors conducted routine tours of the facility to make an independent assessment of equipment conditions, plant conditions, security, and adherence to regulatory requirements. The tours included a general observation of plant areas to determine if fire hazards existed, observation of other activities in progress (e.g., maintenance, preoperational testing, etc.) to determine if they were being conducted in accordance with approved procedures. Also, observations were made of other activities which could damage installed equipment or instrumentation. The tours also included evaluation of system cleanliness controls and a review of logs maintained by test groups to identify problems that may be appropriate for additional followup.

Operational Readiness Plant Walkdowns - The inspectors conducted walkdowns of the plant to determine readiness of Unit 1 for operation. The inspections concentrated on the cleanliness, identification of inoperable components, control of ongoing work, and general plant status. The inspectors listed each deficiency that they identified by room location and defective component identification. These deficiencies were verbally given to the plant staff. The staff reviewed the identified deficiencies against the current list of Maintenance Requests (MRs) to determine if the deficiencies have been previously identified. If the deficiencies had not been previously identified, action was initiated to correct the problem. The following is a listing of the rooms/areas inspected during the walkdowns:

<u>Location</u>	<u>Date</u>
Unit 1 Post Accident Sampling Station	4/16/85
Unit 1 Post Accident Sampling Room	4/16/85
Cask Decontamination Room	4/16/85
Post Accident Ventilation Room	4/16/85
Unit 1 Seal Water Heat Exchanger Room	4/25/85
Boric Acid Equipment Area	4/25/85
Unit 1 Pipe Chase (Elevation 713)	4/25/85
Unit 1 Hot Sample Room	4/25/85
Waste Gas Compressor Room A	4/30/85
Waste Gas Compressor Room B	4/30/85
1C-C Charging Pump Room	4/30/85
Concentrate Filter Cubicle	4/30/85
Concentrate Filter Valve Gallery	4/30/85
Unit 1 Letdown Heat Exchanger Room	4/30/85
Unit 1 Pipe Gallery (Elevation 692)	4/30/85
Unit 1 Penetration Room	5/7/85
Waste Gas Valve Gallery	5/7/85
Unit 1 Additional Equipment Building (Elev. 763)	5/7/85
Unit 1 Additional Equipment Building (Elev. 776)	5/7/85
Unit 1 Additional Equipment Building (Elev. 793)	5/7/85
Unit 1 CRDM and Pressurizer Heater Control Room	5/8/85
Unit 1 Access Room and Air Lock (Elev. 757)	5/8/85
Unit 1 Equipment Hatch	5/8/85
Unit 1 Spent Fuel Pit Exhaust Fans Deck	5/8/85
Unit 1 Spent Fuel Pit HEPA Filter Deck	5/8/85
Unit 1 Vital Rooms, 6.9 KV & 480V Shutdown Bd. Rms.	5/8/85
Spent Fuel Pit Heat Exchangers, Pumps & Filter Area	5/10/85
Unit 1 Access Room and Airlock (Elev. 713)	5/10/85
Unit 2 Vital Rooms, 6.9 KV & 480V Shutdown Bd. Rms.	5/10/85

This effort will continue until all areas which are required for safe operation of the plant have been inspected.

Within the areas inspected, no violations or deviations were identified.

## 8. Review and Followup of Safety Evaluation Report (92718)

The inspectors continued with their review of the Safety Evaluation Report (SER), NUREG-0847 through Supplement 4 in order to evaluate the licensee's implementation of the requirements. The following paragraphs address this additional review:

- a. Supplement 4, Section 15.2.4.4 - This section requires that the licensee perform various testing of the boron dilution alarm circuits. This testing is to include complete circuit testing every 18 months, monthly bistable channel functional checks and annunciator checks every shift. The actual alarm is labeled "Source Range Hi Flux Level at S/D" and occurs whenever Source Range level rises .5 decade above count level at shutdown. The inspector verified that the required monthly and 18 month testing is incorporated into the licensee surveillance program (SI 3.1.8 and 3.1.9). Additionally, the annunciator is checked as part of a general annunciator test done in accordance with AI-2.10, Shift and Relief Turnover.
- b. Supplement 4, Section 3.10 - This section requires that the licensee provide for vibration monitoring of the HPFP pumps, ERCW pumps, and ERCW screen wash pumps located in the ERCW intake station. The inspector verified that vibration monitoring programs for the ERCW and HPFP pumps were covered under the licensee surveillance program (SI 4.05.67p and 7.50). The ERCW screen wash pumps operate intermittently to maintain proper traveling screen differential pressure. Licensee instruction (OSLA-27) provides for planned weekly operation of these pumps as an operator routine, and General Operating Instruction 7 requires that the operator monitor for excessive vibration during any pump operation.
- c. Supplement 4, Section 19 - This section requires an annual inspection program for the cement-mortar lining in the ERCW piping. The inspection would ensure that the lining maintained its integrity and continued to provide corrosion protection to the steel piping. The licensee's inspection program consists of a yearly inspection of a representative piping sample located in the Tennessee River at the TVA Singleton Lab rather than an inspection of the actual ERCW pipe lining at Watts Bar. The licensee plans to take further action if analysis shows that the loss of calcium content exceeds 40%. The inspector considers that the action taken in this case is adequate.
- d. Supplement 3, Section 3.10.2. Specific Concern 7.6 required the licensee to install adjustable end rails on each of the 125V DC Vital Battery Racks. The inspector verified that the adjustable end rails are installed and that spacers are located between the cells as required.

Within the areas inspected, no violations or deviations were identified.

9. Independent Inspection Effort (92706)

- a. The inspectors reviewed the licensee's program to control interface points between an operational unit and a construction unit. Administrative Instruction (AI) - 1.6, "Unit 1 Interface Establishment and Control", is the procedure that controls this program. The purpose of AI-1.6 is to delineate responsibilities and methods for establishing and maintaining interface points in common systems between a licensed and unlicensed unit. The purpose of these interface points is to ensure the integrity of Unit 1 and that Unit 1 operation presents no radiological hazards to personnel completing the construction and testing of Unit 2. The AI applies to all functional or physical points of interaction between licensed and unlicensed systems or structures.

The inspectors' procedure review determined that the program is based on the use of specifically designed hold orders and/or temporary alteration orders. The inspectors noted that a recent audit (QWB-A-85-006, dated 2-8-85) pointed out several problems with the hold order and temporary alteration program. The audit identified administrative problems, valves not locked as specified, and actual temporary alterations not as described on the Temporary Alteration Control Forms (TACFs). The inspectors also questioned an apparent lack of adequate surveillances to assure that interface controls remain effective. Licensee management committed to conduct quarterly surveys by the plant Quality Assurance Staff of the interface clearances and TACFs in effect at the time of the survey. If specific discrepancies are identified, the survey sample size is increased to 100%. The licensee also conducted a 100% survey of the interface program during this inspection period. The inspectors are reviewing the results of this survey and will continue to monitor the program.

- b. Potentially Reportable Occurrence Training

The inspector reviewed the drill packages for the series of Potentially Reportable Occurrences/Licensee Event Reporting (PRO/LER) drills which were conducted between 3/6/85 and 3/15/85. The drill series was not successful in that licensee employees did not effectively handle PROs in a manner that would have assured regulatory compliance. Licensee PRO/LER procedures were not consistently followed and forms were lost. This was largely due to misunderstandings by licensee employees as to the exact scope of the drills and the expected extent of reporting actions for each case. The practice drill initiation forms have been rewritten to provide more clarity and a new series of drills will be performed. This program will be reviewed during future inspections.

## c. Surveillance Test Program

The inspector randomly selected and reviewed 10 surveillance requirements from the February 15, 1985 final draft copy of the Watts Bar Technical Specifications. Specifically, the inspector's review was to verify that the Technical Specification (TS) requirements were properly implemented by the licensee's program. The following surveillance requirements were reviewed to assure that they were properly scheduled and that technically adequate procedures existed:

- TS 4.1.2.3.2 - Charging Pump (Shutdown)
- TS 4.2.1.1 - Axial Flux Difference Monitoring
- TS 4.2.1.2 - Axial Flux Difference (Target Band)
- TS 4.2.1.3 - Target Flux Difference Measurement
- TS 4.2.1.4 - Target Flux Difference Updates
- TS 4.2.5 - DNB Parameters
- TS 4.5.3.2 - ECCS Subsystems (Tave 350 degrees)
- TS 4.5.4b - Refueling Water Storage Tank
- TS 4.7.1.3.1 - Condensate Storage Tank
- TS 4.8.2.1 - 125 Volt DC Sources

The following discrepancy was identified:

TS 4.5.3.2 - ECCS Subsystems (Tave 350F) - This is accomplished by the Surveillance Instruction, SI 2, Rev. 9. However, item 34 incorrectly allows a single Safety Injection (SI) Pump to remain operable although TS 4.5.3.2 specifies that both SI pumps must be inoperable whenever one or more of the cold legs is less than or equal to 350F. This item was corrected in Revision 11 to SI 2.

- d. Based on a Westinghouse analysis, TVA requested that the Boron Injection Tank (BIT) Technical Specification requirements be deleted. The request was approved by the NRC resulting in the elimination of the requirement to maintain a 12% boric acid solution in the BIT along with the associated heat trace required to support this solution concentration. The result of this change was that many drawings and procedures had to be revised to incorporate the new requirements. Applicable design drawings and flow diagrams were revised by the Office of Engineering per Engineering Change Notice (ECN) 5457. The ECN required that the recirculation flow path from the BIT to the Boron Storage Tanks be secured, heat tracing associated with the BIT be de-energized and BIT temperature indication disabled. In addition to

the actual physical work, numerous procedures required revision to recognize the new system configuration. Several Operational Instructions, Surveillance Instructions and Emergency Procedures were revised.

The inspector reviewed the ECN and selected drawings and determined that the required revisions per the ECN had been accomplished. The inspector reviewed the following Operations Instructions:

- GOI - 1
- SOI - 63.1
- SOI - 62.5
- AOI - 21
- E - 0, E - 1, E - 2, E - 3
- SI - 6.11

The inspector determined that the procedures were revised as required by the system changes. Based on this review, the inspector considers that the licensee has incorporated the new requirements into applicable procedure.

- e. On May 27, 1981, Westinghouse informed the licensee of a problem with the volume control tank (VCT) level control system which they deemed reportable under 10 CFR 50.55(e). Westinghouse identified that this problem was applicable to Watts Bar Units 1 and 2. The licensee reviewed this item and issued NCR WBNNEB 8114 dated June 2, 1981. This NCR was reviewed for reportability per the licensee system, i.e., Determination of Reportability Information Worksheet for 10 CFR 50.55(e) and Determination of Reportability 10 CFR 21 Worksheet. The conclusion reached after each of these reviews was that the problem did not apply to Watts Bar because there are redundant valves which will switch suction of the centrifugal charging pumps from the VCT to the refueling water storage tank (RWST).

Further review of sections 9.3.4.2.1 and 9.3.4.2.5 in the FSAR also indicate that the suction will switch to the RWST. Review of TVA drawing 47W611-62-4, Rev. 6, indicated that the logic was set up to provide automatic crossover if both level transmitters failed below the low-low VCT level. Therefore, for the problem identified by Westinghouse, the review by the licensee may not be correct.

After discussion with the licensee by the inspector, a new NCR (WBN NEB 8504) was written. The inspector identified the aspects of this issue as an Unresolved Item (390/85-36-01). This will remain unresolved until the licensee provides corrective action for the new NCR, determines reportability of the VCT level control system problem, and determines why the initial NCR was improperly reviewed.

Within the areas inspected, no violations or deviations were identified.

## 10. Testing of Pipe Support and Restraint Systems (70370C)

The inspector toured areas of the Unit 1 auxiliary building and containment. Numerous snubbers and restraints were observed. Visual examinations were conducted to check for deterioration and physical damage of mechanical snubbers. Visual examinations were also conducted to check for proper installation of base support plates, fasteners, locknuts, brackets, and clamps of fixed pipe supports.

Within the areas inspected, no violations or deviations were identified.

## 11. TMI Action Items Closeout (25401)

(Closed) TMI 390/80-RD-23, NUREG 0737 Item II.F.1, "Accident Monitoring Instrumentation". This item was addressed in Inspection Report 390/85-08. The outstanding issue that remained related to a human-factor analysis requirement identified in the subject NUREG report, along with integration of the instrumentation into applicable operator procedures and training.

TVA, in a letter from K. P. Zimmerman to File dated April 5, 1985, stated that an additional Human Factors review had been performed on all instrumentation changes required by Item II.F.1. This review took into account the impact the change had on the MCR workspace and instrumentation grouping, sequential order, control/display relationship and mimic and flow arrangement as well as how these instruments integrated into emergency procedures.

The inspector reviewed the letter and also reviewed the referenced procedures (Emergency Procedures, Annunciator Response Procedures and System Operating Procedures). The letter also identified several Human Factors Concerns (HECs) with regards to each of the monitors reviewed. The inspector also reviewed a memorandum from J. C. Standifer to D. W. Wilson dated April 19, 1985, which addressed action required to resolve the HECs in the Zimmerman memorandum. This memo stated that the HECs have been reviewed and listed those HECs that should be incorporated into the Maintenance Request Program. All remaining HECs will be addressed as part of the Control Room Design Review (CRDR). The inspectors will continue to follow these concerns as part of their review of the implementation of the CRDR Program. The inspector considers that all actions necessary to close this item have been completed.

## 12. IE Bulletin Followup (92703)

(Open) IEB 84-03, Refueling Cavity Seal. This bulletin discusses the potential for and consequence of a seal failure in the reactor cavity during refueling. The analysis of seal failures at WBN is currently under review and will be covered in the IE inspection program by Temporary Instruction (TI) 2515/66.

## 13. IE Information Notice (IEN) Followup (92717)

The following IE Information Notices were reviewed to ensure their receipt and review by appropriate licensee management. The TVA Office of Engineering in Knoxville, TN and the Watts Bar Site Director each receive and process the IENs for review and determination of applicability to the facility. At the Watts Bar facility, the Regulatory Engineering (RE) and Compliance sections regularly review IENs and other pertinent information such as vendor information letters, NRC Bulletins and Generic Letters, and INPO Summaries; this review of operating experience was established to fulfill the requirements of NUREG 0737. Per Standard Practice WB 6.3.13, Nuclear Operations Experience Review Program, RE is responsible for review and dissemination of any relevant material from IENs to the site and other organizations for review. This RE responsibility was implemented in January 1985.

The inspector reviewed the licensee's program for the review of IENs. For selected IENs, the inspector found that the licensee has taken or planned some action to resolve each notice. However, for 1985 IENs, the RE section appeared to be slow in disseminating the IENs to appropriate review sections. During the inspector's initial review of the RE log on IEN status, a fairly large number of IENs were not distributed to appropriate sections for either action or information only. Subsequently, these IENs were dispatched to different plant sections. Also, for some of the 1984 IENs, a longer than expected amount of time was taken by the licensee to process and implement recommended actions from the central office. For example, recommendations made from the central office in review of IEN 84-06, Steam Binding of Auxiliary Feedwater Pumps in April 1984, didn't finally become implemented in the appropriate SOI-3.2, Auxiliary Feedwater System, and OSLA-27, Assistant Unit Operator Work Stations, until October 23, 1984 and February 19, 1985, respectively. Based on the above examples, the inspector expressed concern on the extended time that the licensee has taken to review and take appropriate action for relevant IENs. This concern will become of importance when the plant becomes operational.

Information  
Notice No.

Subject

84-01

Excess Lubricant in Electric Cable Sheaths

84-06

Steam Binding of Auxiliary Feedwater Pumps

The licensee action on this notice resulted in revisions to procedures OSLA-27, Assistant Unit Operator Work Stations and SOI-3.2, Auxiliary Feedwater System. The Operations Section Letter, OSLA-27, Rev. 25, issued on February 19, 1985 included additional steps for

the AUO to check the AFW pump discharge piping temperature and the pump casing temperature on each shift. The temperature sensors were installed in the AFW pump discharge piping, and are utilized as a computer data point. System Operating Instruction, SOI-3.2, Rev. 8, dated October 23, 1984 was updated to include precaution step K to check for backleage through check valves of the AFW pump discharge piping. Also, per the licensee instructions, if the AFW discharge piping is found to be hot, the casing of the associated AFW pump is to be vented every four hours. Furthermore, the licensee instructed the Nuclear Training Branch to incorporate the concerns of this IEN into the training program for the operators.

- 84-08 10 CFR 50.7 Employee Protection
- 84-10 Motor-Operated Valve Torque Switches Set Below the Manufacturer's Recommended Value
- 84-12 Failure of Soft Seat Valve Seals
- 84-20 Service Life of Relays in Safety-Related Systems
- 84-22 Deficiency in COMSIP, Inc. Standard Bed Catalyst

The licensee has returned the containment hydrogen analyzer catalyst beds to the vendor and replaced them with new ones. Scaling and setpoint calibration of the hydrogen monitor instrument loops was performed per Maintenance Report No. A-401737.

- 84-44 Environmental Qualification  
Testing of Rockbestos Cables
- 84-55 Seal Table Leaks at PWRs
- The licensee Compliance section transmitted this IEN to Mechanical Maintenance for action in July 18, 1984. Action required was to incorporate changes in MI-94.3, to address caution and warning instruction for cleaning thimble tubes and ensure that the unit is in cold shutdown before cleaning is performed. A draft version of MI-94.3 was released to various plant sections for review and comment prior to its submittal for PORC review.
- 84-57 Operating Experience Related to  
Moisture Intrusion in Safety-  
Related Electrical Equipment at  
Commercial Power Plants
- 84-59 This IEN pertains to inten-  
tional misuse of dosimetry  
devices. The licensee has  
reviewed and has made revisions  
to procedures HP-DSIL-19,  
Interface and Area TLD's and  
HP-DSIL-13, Issue and Control  
of Personnel Dosimetry. The  
changes are designed to improve  
TLD controls.
- 84-61 Overexposure of Diver in  
Pressurized Water Reactor (PWR)  
Refueling Cavity)
- 84-65 This notice informed the  
licensee of a potential problem  
in using improperly rated fuses  
that may result in an  
electrical ground fault through  
the fuse and lead to loss of  
other essential electrical  
services. The licensee  
performed a detailed review of

this problem and instituted appropriate actions in their fuse control plan and in Administrative Instruction, AI 9.10, Revision 5, Fuse Control.

- 84-78 Underrated Terminal Blocks That May Adversely Affect Operation of Essential Electrical Equipment.
- 84-83 Various Battery Problems
- 84-84 This IEN provided notification of two potentially significant deficiencies associated with Westinghouse inverters -- deficient capacitor terminations and inadequately secured transformers. The licensee has reviewed this information and determined that per Westinghouse Technical Bulletin NSD-TB-84-08, Watts Bar facility does not have the non-PCB capacitors with incorrect termination. For the second deficiency, the licensee verified use of affected G40 reactor core transformers; however, they have operated the transformer well in excess of six months which satisfies the acceptance criterion. Westinghouse Technical Bulletin NSID-TB-84-11, states that any Ferro-resonant transformer operated under load for a six month period that does not exhibit output degradation may be considered satisfactory.
- 85-03 Separation of Primary Reactor Coolant Pump Shaft and Impeller
- 85-04 Inadequate Management of Security Response Drills
- 85-09 Isolation Transfer Switches and Post-Fire Shutdown Capability

85-14

Failure of a Heavy Control Rod  
(B4C) Drive Assembly to Insert  
on a Trip Signal

14. Comparison of As-Built Plant to FSAR Description (37301)

On May 16, 1985, the inspector reviewed drawing 47W 866-1, Rev. 30 for conformance to the Emergency Gas Treatment System Schematic Diagram 6.2.3.11 in the FSAR. The inspector noted that the location of some check valves and flow instruments on the diagram do not agree with the locations depicted on the as-constructed drawing. Followup of actions required to correct this discrepancy is identified as Inspector Followup Item (390/85-36-02).

In the areas inspected, no violations or deviations were identified.

15. Followup of Regional Requests (71302)

The station batteries were inspected per guidance provided in the Regional Office Notice No. 2201. The inspection covered three general category areas concerning battery operability: a) review and applicability of battery problems found at several other facilities, b) battery inspection in areas of potential discrepancy (i.e., battery inspection hints) and c) station battery record review.

The inspector reviewed the Surveillance Instructions (SI) and associated data packages, procedures, standards, Technical Specification Surveillance Requirements (SR), and technical manuals applicable to the 125V Vital Batteries and the Diesel Generator (DG) Batteries to determine if the installation, operation, and maintenance performed by the licensee are adequate to maintain operability.

The applicable documents for this equipment are the following:

- SR 4.8.2.1 and 4.8.2.2, DC Sources
- SR 4.8.1.1.3, AC Sources
- SI 8.2, Rev. 11, Vital Battery Weekly Inspection and Test
- SI 8.3, Rev. 10, DG Battery Weekly Inspection and Test
- SI 8.4, Rev. 5, Vital Battery Quarterly Inspection and Test
- SI 8.5, Rev. 6, DG Battery Quarterly Inspection and Test
- SI 8.21, Rev. 7, Vital Battery Inspection and Charger Test
- SI 8.22, Rev. 9, 125V DC Vital Battery Service Test
- SI 8.23, Rev. 3, DG Battery Inspection and Charger Test

- SI 8.30, Rev. 8, 125V DC Vital Battery Discharge Test
- IEEE Standard 450-1975,1980, Recommended Practice for Maintenance, Testing and Replacement of Large Lead Storage Batteries for Generating Stations and Substations
- Gould Stationary Battery Installation and Operating Instruction Manual (125V Vital Battery)
- C&D Stationary Battery Installation and Operating Instruction Manual (DG Battery)
- Gould Drawing No. 062823D
- Electrical Department Section Letter (ESL) 5.17, Rev. 0, Battery Capacity Test System
- Final Safety Analysis Report, Chapter 8.3.2

The results of the inspection activity are presented below:

- A.1 Specific gravity correction for either temperature or electrolyte level.

The inspector verified that the licensee does correct specific gravities for varying temperatures and levels. This is accomplished during weekly and quarterly battery checks for the vital and diesel batteries.

- A.2 Maintaining records of battery charging.

The inspector verified that the licensee does maintain records of battery charging by use of a battery log and by SI data packages. The information in the log and SI data packages is specific, i.e., time charge started, time charge complete, overall results, etc.

- A.3 Performance of acceptable load discharge test to measure actual battery capacity.

The inspector verified that SI 8.30 gives the formulas for calculating the load discharge test currents and that the licensee conducts the test at that calculated test current.

- A.4 Procedure use for conducting an equalizing battery charge.

The inspector found that the licensee has no procedure for conducting equalizing battery charges. As a result, monitoring of the cells is not performed according to vendor recommendations as described in paragraph C.5 of this report.

- A.5 Failure to meet the initial condition of the battery to be on a float charge while in performance of weekly and quarterly surveillances.

The inspector verified that weekly and quarterly surveillance tests of the batteries are performed while they are on a float charge.

- A.6 Failure to take corrective actions for deficient readings obtained during weekly and monthly surveillances.

The inspector verified that, during performance of all surveillances, maintenance requests were generated or equalizer charges were performed to correct deficient readings as required.

- A.7 Proper arrangement of individual battery cells with respect to the battery rack.

The inspector verified that the batteries are installed in accordance with the vendor drawings as described in paragraphs B.3 and B.4 for the possibility of cell deformation due to nonconformance with the seismic design.

- B.1 Single Cell Chargers.

The inspector reviewed the licensee's program to determine if any single cell chargers are in use that would violate class IE independence as specified in IEEE 384-1977. The inspector was informed that the licensee has not used single cell chargers as of this report. However, further review is required by the inspector to determine if there is a program in place should a single cell charger be used in the future.

- B.2 Cell operation and maintenance.

The inspector visually inspected the vital and D/G batteries during conduct of an equalizer and a float charge. During these charges the inspector verified that the cells were not improperly gassing and that no sediment had collected at the bottom of the cells. It should be noted that lead-calcium batteries do not experience significant gassing during an equalizer charge.

- B.3 Battery installation.

The inspector verified that the vital batteries are installed in accordance with the vendor drawings. This was accomplished by visually checking that adjustable end racks were properly installed in accordance with Work Plan 4598 and 5215. These work plans were issued to provide guidance for the installation of adjustable steel brackets for seismic support. Also, the inspector measured a representative sample of the cell-rack spacing and verified that the end cell to rack spacing is greater than 1/8-inch, but less than 1/4-inch.

B.4 Battery construction - spacing material between individual cells.

The inspector visually inspected the type of spacing material used between individual battery cells, and verified installation of acceptable poly spacing material.

C.1 Technical Specification surveillances are conducted at the proper intervals.

The inspector reviewed all SI data packages that were completed in 1985. These packages included SI 8.2, 8.3, 8.4, 8.21, and 8.23. The inspector verified that these SI's were all conducted at the proper intervals as specified in the TS.

C.2 Float voltage is maintained in accordance with the vendor technical manual.

The inspector reviewed the D/G and vital battery weekly SI data packages completed in 1985, and verified that the float voltages were maintained in accordance with the vendor technical manual.

C.3 Service tests are performed after completion of system design changes (i.e., load change).

The inspector was informed by the licensee that the Office of Engineering (OE) is responsible for determining if a service test is required after completion of system design changes. The inspector will review the OE program to determine if there are adequate provisions to require service tests when design changes are implemented.

C.4 Service and performance tests are conducted in accordance with commitments and the Technical Specifications.

The inspector reviewed IEEE 450-1975 which recommends that the 18 month service test and the 60 month performance test be accomplished prior to performing an equalizer charge and a battery connection check. Performing tests in this manner will check the battery capacity from the most stringent test conditions. If these tests do not deliver the expected capacity, then the tests should be repeated after performing an equalizer charge (within a 3 to 7 day time period) and a battery connection check. The inspector reviewed SI 8.22 and SI 8.30 and found that these SIs require that an equalizer charge be performed just prior to the scheduled service and performance tests, respectively. Consequently, these tests are conducted in a non-conservative manner because they fail to take into account all of the factors, including maintenance, that determine battery capability.

Resolution of the licensee's method of conducting performance tests, service tests, and battery preoperational tests in accordance with IEEE 450-1975, 1980 is identified as Unresolved Item (390/85-36-03).

- C.5 Battery equalizer charges are performed in accordance with the vendor technical manual.

The licensee does not perform battery equalizer charges in accordance with the vendor manual with regard to monitoring of cell voltages during a charge. The vendor recommends that monitoring of cell voltage should be started during the latter 10% of the applicable time period to determine the lowest cell in the battery. In addition, since there is no procedure for conducting an equalizer charge, specific gravities are not taken after an equalizer charge until the weekly SI for pilot cell readings or the quarterly SI for all cell readings. It is therefore possible that problems occurring in one of the battery cells may not be noticed for up to 3 months.

- C.6 Battery equalizer charges are conducted when required:

- a. ICV  $\pm$  .04 VDC from battery average
- b. average specific gravity drops .010 from acceptance values
- c. any individual cell specific gravity is .010 below other cells average.

The vendor technical manual recommends that an equalizer charge be performed when the floating voltage of the pilot cell (or any cell for the quarterly reading) is below 2.13 volts, when the floating voltage of one individual cell is more than  $\pm$ .04 volts below the average for the battery, or when the corrected specific gravity of the pilot cell (or any cell for the quarterly reading) is more than .010 below its full charged value. In addition, IEEE 450-1975 recommends that an equalizer charge be performed when the specific gravity for an individual cell is .010 below the average of the other cells. Table 4.8-2 of the Technical Specifications gives the battery surveillance requirements for the vital batteries. This table specifies that the floating voltage be maintained greater than or equal to 2.13 volts for each cell (including pilot cells), but does not give a limit for individual cell voltages if they differ from the average.

In addition, Table 4.8-2 specifies that the specific gravity not be more than .020 below the average of all connected cells, not the .010 specified in IEEE 450-1975.

- C.7 ICVs and specific gravity readings are properly compensated for temperature and electrolyte level.

The inspector verified that the licensee does correct specific gravities for varying temperatures and levels. This is accomplished during weekly and quarterly battery checks for the vital and diesel batteries.

- C.8 Post-maintenance testing is performed after cell jumpering or cell replacement.

The inspector was informed that the licensee has not jumpered or replaced any battery cells as of this report other than the jumpering that was performed during vital and diesel battery installation to meet bus voltage requirements. These cells will not be reused so no testing is required. However, the inspector will review the program to handle post-maintenance testing of the battery should cell jumpering or replacement be necessary in the future.

- C.9 Proper basis established for addition of acid to station battery, if performed by licensee.

The inspector was informed by the licensee that the offsite Nuclear Control Office (NCO) is responsible for acid additions to the batteries. The inspector will review the NCO's program to handle additions of acid to the battery.

Followup of the inspector's concerns with regard to the preparation of an equalizing charge procedure, including cell monitoring during and after equalizer charges, and differences in equalizer charge requirements between the vendor technical manual and the Technical Specifications, as discussed in paragraphs A.4, C.5, and C.6 is identified as Inspector Followup Item (390/85-36-04).

16. Information Meeting with Local Officials (94600C)

On May 8, 1985, the Section Chief from Region II, Atlanta, for Watts Bar and the Senior Resident Inspector at Watts Bar met with the following local officials: the Mayor, City Manager, and one Councilman in Spring City, Tennessee, and the Mayor and City Manager for Dayton, Tennessee. During these meetings with local representatives, the following topics were discussed:

- a. Purpose of meeting
- b. Introduction of Region II personnel and regulatory relationship to TVA
- c. Brief description of NRC organization and responsibility
- d. Brief description of NRC, TVA, State emergency planning activities
- e. Answers to specific questions, and business telephone numbers of appropriate NRC contacts.

The local officials were pleased with the discussions and felt that the meetings were worthwhile and informative.