



Lawrence Livermore National Laboratory

*Docket Files*

March 5, 1986

NSSP-NV-609

Mr. Norman Merriweather  
U. S. Nuclear Regulatory Commission  
Region II  
Suite 2900  
101 Marietta Street, NW  
Atlanta, Georgia 30323

Dear Mr. Merriweather:

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 AND 2, INPUT  
FOR NRC ATWS INSPECTION REPORT NO. 86-04,  
DOCKET NOS. 50-390, 50-391

Enclosed is the final LLNL input for the Watts Bar Nuclear Plant, Unit 1  
and 2, NRC ATWS Inspection Report.

Sincerely,

*Paul M. Chan*

Paul M. Chan  
702-295-2411 (comm.)  
575-2411 (FTS)

PMC:bd

Enclosure as stated

8704020522 870305  
PDR ADOCK 05000390  
PDR

University of California  
Lawrence Livermore National Laboratory

P.O. Box 45  
Mercury, Nevada 89023

*IE01*

INSPECTION REPORT

WATTS BAR NUCLEAR PLANT, UNIT 1 AND 2

1. APPLICANT'S EMPLOYEES CONTACTED

(615)-365-XXXX

R. L. Heatherly, Supervisor of Drawing and Vendor Manual Control Unit	X-3742
L. E. Ottinger, Compliance Engineer	X-8526
M. J. Burzynski, Regulatory Engineer	X-8863
F. Campbell, Licensing (Chattanooga)	X-4882
J. MacDonald, Compliance Engineer	X-8526
R. Greer, Electrical Maintenance Supervisor	X-8109
D. Anderson, Lead Electrical Maintenance Engineer	X-8591
P. Talent, Planning and Scheduling Engineer	X-8542
E. Lee, Instrument Engineer Supervisor	X-8466
C. E. Wood, Electrical Maintenance Engineer Supervisor	X-8108
M. B. Shymlock, NRC Senior Resident	X-8676
H. Irick, Engineering Aide	X-8228
R. D. Taylor, Electrician	X-8168
L. Brotherton, Electrician	X-8168
C. Steele, Electrical Shop Foreman	X-8168
B. Bates, Reactor Operator	X-8213
S. Cleage, Reactor Operator	X-8213
J. Canerdy, Electrical Maintenance Supervisor	X-8617
L. Good, Senior Instrument Mechanical Foreman	X-8471



1. APPLICANT'S EMPLOYEES CONTACTED (cont'd)

J. McKinney, Instrument Mechanic	(615)-365-XXXX X-8471
G. Hyden, Senior Instrument Mechanic	X-8471
R. Head, Senior Instrument Mechanic	X-8471
C. Campbell, Senior Instrument Mechanic	X-8471
C. DeBlonk, Assistant Shift Engineer	X-8213
R. M. McCollum, Instrument Maintenance Supervisor	X-8466
E. R. Ennis, Plant Manager	verbal only

Other Personnel Contacted:

G. Yetter, Westinghouse Site Manager	X-3127
J. Murphy, Westinghouse Site Manager	X-3127
W. E. Hollan, NRC Resident	X-8676
C. Caldwell, NRC Resident	X-8676

2. DOCUMENTS EXAMINED AND/OR REVIEWED

1986 WBN Training Schedule for Electrical Maintenance.

TVA Letter of June 4, 1984. Kramer to NRC Adensam responding to the NRC SER request for additional information on a plant specific basis regarding Reactor Trip CB items.

WBN Response of November 7, 1983 to Generic Letter 83-28,  
L. M. Mills to E. Adensam, all items.

NRC Letter of December 10, 1985 from Youngblood to TVA H. G. Parris regarding Generic Letter 83-28, Item 3.2.2.

TVA response of January 17, 1986 from Domer to NRC Youngblood regarding Generic Letter 83-28, Item 3.2.3.

TVA Letter of February 5, 1986 from Cottle to Gridley, regarding 1250 cycle replacement interval criteria for UV trip attachments for DS-416 CB, with WOG Attachment of December 9, 1985, Butterfield to Wright.

Administrative Instruction (AI) AI-3.7, "Maintenance and Preventive Maintenance and Preventive Maintenance Instructions, Preparation, Control, and Use," Revision 9.

AI-9.2, "Maintenance Requests and Equipment Maintenance History," Current Revision as of February 25, 1986.

Maintenance Instruction (MI) MI-85.6, 480 Volt CRDM (Reactor Trip), Switchgear Inspection, Revision 8,



2. DOCUMENTS EXAMINED AND/OR REVIEWED (cont'd)

MI-0.17, "Kerotest Manual "Y" Globe Valve Maintenance Instruction and Repair," Revision 7.

Surveillance Instruction (SI) SI-3.1.1 "Functional Test of Manual Reactor Trip Channels (Prior to Startup)," Revision 7.

SI-3.1.26, "Functional Test of Automatic Reactor Protection Trains and Reactor Trip Breakers," Revision 10.

Watts Bar (WB) WB 6.3.13, "Nuclear Operating Experience Review Program," Current Revision as of February 25, 1986.

MI-3.1.29, "Reactor Trip Breaker Response Time Test (once/18 months)," Revision 5.

Instrument Maintenance Instruction (IMI) IMI-99, "Reactor Protection System and Engineered Safeguards," Revision 4.

MR Request A-404856. Data Package to "Perform MI-85.6 on A Train Reactor Trip Breaker for NRC Audit."

MR Request ID number and sheets not supplied. Cover and data sign off sheets only to perform SI-3.1.26-I on A Train Reactor Trip Breaker for NRC Audit.

MR Request A-415812 and A-411969 sheets not supplied. Cover and data sign off sheets only to perform MI-0.17 on Valves 1-VTV-68-507 and 1-1SV-62-361A. (Pages 1 and 2 of 6 of A-411969 missing). ?

3. POST-MAINTENANCE TESTING

The inspector reviewed the applicant's post-maintenance testing procedures and activities to verify that the requirements of Generic Letter (GL) 83-28 were being met and that the commitments in the applicant's response were being implemented at the Watts Bar Nuclear Plant. The inspector examined procedures and completed maintenance records, and witnessed the specially scheduled partial inspection and post-maintenance testing of a reactor trip breaker, and examined the completed records of the maintenance and repair of a globe valve. The inspector interviewed pertinent applicant personnel to determine the adequacy of the applicant's post-maintenance test program. The results of the inspection are as follows:

Observations Regarding MI-85.6, Reactor Trip Breaker Inspection

Appendix A of this MI directs the Electronics Maintenance Shop in the inspection, adjustment, lubrication, component replacement, UVTA dropout voltage test, and shunt trip attachment test on Trains A and B, and Bypass A and B breakers.

The post-maintenance circuit breaker operability tests needed to satisfy the Technical Specification Requirements are performed by notifying the Instrument Maintenance Shop to execute SI-3.1.26 and IMI-99, as appropriate.

Appendix B of this MI overlaps Appendix A and directs the execution of additional steps such as the inspection of the MG set circuit breaker and the bus and panel boards. The choice of Appendix A or Appendix B is determined by the operational mode status of the unit. (Modes 1 through 6).



Observations Regarding MI-85.6, Reactor Trip Breaker Inspection (cont'd)

WBN Plant Planning and Scheduling periodically issues a MI list to the Electrical Maintenance (EM) section to initiate and process maintenance work orders. Orders are written, QA'd, work performed, post-maintenance tested, signed off by Operations and again reviewed by QA.

It is possible for Procedures discrepancies or deficiencies identified during the execution of the MI or SI steps to be flagged for correction or modification by noting a "DI," or discrepancy indication, which is subsequently considered for corrective action by the specification writers.

Inability to sign off a procedure step, because of repairs identified for corrective action during work execution is addressed by a MI/SI work stoppage and the issue of an "M.R.," or maintenance request for corrective action.

Advice regarding changes to vendor manuals are sent to Electrical Maintenance from Document Control and are given an "Open Item Station Log" (OISL) or notification of change.

Special one-time changes, initiated from the above or other sources, utilize an "Appendix G" to temporarily change the work order procedure as appropriate.

Before issue for execution, a MR request is reviewed by the cognizant SRO, STA, Maintenance Section, and Engineering. Remarks written in the work order papers are referenced to the appropriate MR.

Observations Regarding MI-85.6, Reactor Trip Breaker Inspection (cont'd)

The MI calls for recording trip counter readings and replacement of UVTA and shunt trip coils after 1250 operations. However the breakers do not now have counters and this step is presently bypassed or marked non-applicable. The applicant planned to install counters at an unstated later date.

The applicant planned to estimate the number of operations which have occurred after the counters are in place. This number will be the reference number basis for future recorded counts.

The Electrical Maintenance section expects in two months to have in place a trending program for selected operating and testing parameters for electrical equipment. The specific parameter list is not yet complete.

A "MR" is used only to correct something found wrong with the equipment being worked on.

An "Appendix G" is an "instruction to change" and is a way to temporarily correct, modify, or otherwise alter the printed specification (e.g., MI, SI).



Observations Regarding the Witnessing of MI-85.6 Performed on Unit 1  
Train A Reactor Trip Circuit Breaker

The tests were performed on a Train A DS-416 circuit breaker S027-Y-2697 B-1, WBN Serial RT-01.

The data package sheets include a blank in which to record the circuit breaker serial number.

There is no reference to a circuit breaker response time test in this MI.

The performance was new revision of a new specification that had only been walked-through prior to the witness test performance.

Several steps were not performed because they are normally done only if the UVTA is replaced because it is faulty, or has exceeded 1250 operations.

The inspector expressed concern that a torque wrench was not used to tighten loose nuts/bolts. It was explained that the need for specific torques would be included in orders by the planner if deemed to be necessary.

Several steps were not performed because they are normally done on a periodic schedule basis, or when Appendix B is selected.

The inspector noted that Step 5.1.4 calls for one type of lubricant (old) and Steps 5.1.10 and 6.8.13 call for another (new) type of lubricant. This is further accounted for in the Vendor Manual Control section of this report.

Observations Regarding The Witnessing of MI-85.6 Performed on Unit 1  
Train A Reactor Trip Circuit Breaker (cont'd)

The cognizant engineer expressed concern that the "new" lubricant specified by Westinghouse was more difficult to apply to some parts, and therefore may not do an effective job. The Westinghouse resident engineer stated that Westinghouse felt the new lubricant was superior. The inspector recommends that this difference of opinion be mutually resolved.

Observations Regarding The Witnessing of SI 3.1.26 Performed on The  
Reactor Trips Circuit Breaker

This SI is called for in MI-85.6 but does not refer to a circuit breaker response time test.

This witness test was delayed twice because of inadvertent tripping of the bypass circuit breaker by others remote from the Reactor Protection System equipment room.

The data package sheets did not have a blank space in which to record the circuit breaker serial number.

A DI will be written because the test was delayed to allow the crew to verify that an inspector observed an unidentified 12 volt indication on the UV coil voltage meter during some steps was normal. This is not so stated in the procedure. (e.g., in the vicinity of Steps 4.2.5.4, 5, 6 and perhaps 4.2.16 to 4.2.19.5).

A second DI will be written because the inspector observed that the instrument mechanic had to repeat a previously signed-off step in order to complete Step 4.2.56. The procedure is not clearly worded.



Observations Regarding The Witnessing of SI 3.1.26 Performed on The  
Reactor Trip Circuit Breaker (cont'd)

A third DI will be written because it is not clearly stated in Steps 4.2.64, 65, 66 whether Annunciator Window 13 should be reset after Step 4.2.63 and each succeeding step through Steps 4.2.66.

The inspector observed that there is no provision in this SI to record the number of CB operations which occur.

General Inspector Comments

SI 3.1.29 describes how to determine circuit breaker trip time but states no acceptance criteria. Instead it describes how to determine overall channel response time using SI-3.1.27, SI-3.1.29, and SI-3.2.20 (the inspector did not examine the latter two SI's or witness their execution).

The inspector recommends that an acceptance criteria for the Reactor Trip CB trip time be inserted in SI-3.1.29 and that SI-3.1.29 be referenced in MI-85.6.

The inspector recommends that the applicant commit to respond to the systematic trending desired by the NRC. The commitment should unambiguously describe what parameters will be trended, how they will be determined, what the format and content of the records will be, and who will be responsible for collecting, maintaining, and reporting the data. These parameters are: UV coil dropout voltage, response time, insulation resistance, and trip force.

General Inspector Comments (cont'd)

The inspector recommends that a systematic record of Reactor Trip cycles be kept. This record should include trip cycles accumulated from all sources (e.g., MI's , SI's, etc.)

The inspector observed that MIs and SIs are in a state of flux and revision because of the unlicensed interim status of the plant.

The inspector observed a general WBN acceptance of the value of post-maintenance testing, and a willingness and enthusiasm to strive for development of mutually acceptable methodologies and procedures to satisfy the NRC requirements.

Section 6.9 of AI-3.7 contains general instructions for the inclusion of post-maintenance testing in other WBN procedures. However, the inspector observed that MI and SI procedures did not always clearly and specifically identify the post-maintenance testing steps and specific acceptance criteria/parameters. It is recommended that Section 6.9 of AI-3.7 be made more prescriptive, and that post-maintenance test steps and acceptance criteria be specifically identified in other WBN procedures.



4. VENDOR INTERFACE AND MANUAL CONTROL

The Watts Bar Nuclear Plant's (WBN) Vendor Interface and Manual Control Program is similar to that at its sister plant at Sequoyah. The WBN program follows TVA system-wide guidelines and is committed to the use of the Nuclear Plant Reliability Data System (NPRDS). The program is characterized by the existence of a Drawing and Vendor Manual Unit (D&VMU) on site, and by heavy reliance on TVA's Office of Engineering (OE) in Knoxville to provide WBN with vendor manuals and drawings, and their revisions and updates.

The inspector conducted a review of the applicant's procedures to verify that they were consistent with the applicant's responses to GL 83-28.

The following procedures were reviewed:

Administrative Instructions (AI)

AI-4.4, "Vendor Manual Control," Revision 7.

AI-4.3, "Drawing Control for Unlicensed Units," Revision 5.

AI-3.7, "Maintenance Instructions, Preparation, Control, and Miscellaneous," Revision 7.

AI-4.8, "Controlled Documents," Revision 8.

AI-7.6, "Q-List," Revision 0.

Nuclear Quality Assurance Manual (NQAM)

NQAM, Part III, Section 1.1, "Document Control," dated March 21, 1985.

NQAM, Part V, Section 6.1, "Configuration Drawing Control," dated December 31, 1984.

NQAM, Part V, Section 6.2, "Vendor Manual Control," dated December 31, 1985.

TVA Procedure

No. 1707.03.04, "Vendor Manual Program," dated December 21, 1984.

Office of Engineering Procedures

OEP-09, "Procurement," Revision 0.

OEP-16, "Design Records Control," Revision 0.

The inspector noted that the applicant has prepared and revised procedures to delineate responsibilities and authorities for vendor manual and drawing controls.

The inspector observed the operation of the Drawing and Vendor Manual Control Unit at WBN, and noted that the applicant has an adequate vendor manual control system in place. The vendor manuals are located, updated, and controlled in a designated area. The revisions are distributed to the cognizant disciplines in accordance with plant procedures. Interviews revealed that WBN personnel managing and controlling the vendor manual program were familiar with the TVA vendor manual control program. The inspector noted that there is adequate tracking of vendor manual revisions and updates. The inspector followed Temporary Instruction 2515/64, Revision 1, "Near-Term Inspection Followup to GL 83-28," in his review.



TVA Procedure (cont'd)

The inspector also examined the following two safety-related manuals of vendors who have gone out of business.

5. No contract number, ID #1606

Safety Valve Type 1511 and 1811 by Dresser Industries.

6. Contract No. 54114-1, ID #0904

Diaphragm Valve Maintenance and Instruction Manual by ITT Grinnell.

The inspector noted that all the manuals examined have the appropriate validation stickers and markings. None of the manuals examined have any revisions or updates. The inspector, however, noted that the maintenance manual on DS-416 Reactor Trip Circuit Breaker by Westinghouse was recently replaced by a new manual dated October 1984. This new manual is in the applicant's file. The vendor's recommendation on lubricants was not implemented via applicant's procedures for Reactor Trip Breaker Maintenance MI-85.6. Whereas the vendor recommended in October 1984, the use of a Molykote BR-2 lubricant, the applicant is still referring to a lubricant similar to Molykote M-30 in paragraph 5.1.4 of its procedure MI-85.6, dated February 1986. The applicant did refer to Molykote BR-2 in paragraph 5.1.10 of the same procedure. This is a potential deviation for calling out in a maintenance procedure an old lubricant which had been superseded by a new lubricant. The inspector noted that MI-85.6 was ran for the first time at WBN during the inspector's ATWS inspection visit, and concluded that the applicant lacks experience in the maintenance of reactor trip breakers.

TVA Procedure (cont'd)

The inspector also examined the following two safety-related manuals of vendors who have gone out of business.

5. No contract number, ID #1606

Safety Valve Type 1511 and 1811 by Dresser Industries.

6. Contract No. 54114-1, ID #0904

Diaphragm Valve Maintenance and Instruction Manual by ITT Grinnell.

The inspector noted that all the manuals examined have the appropriate validation stickers and markings. None of the manuals examined have any revisions or updates. The inspector, however, noted that the maintenance manual on DS-416 Reactor Trip Circuit Breaker by Westinghouse was recently replaced by a new manual dated October 1984. This new manual is in the applicant's file. The vendor's recommendation on lubricants was not implemented via applicant's procedures for Reactor Trip Breaker Maintenance MI-85.6. Whereas the vendor recommended in October 1984, the use of a Molykote BR-2 lubricant, the applicant is still referring to a lubricant similar to Molykote M-30 in paragraph 5.1.4 of its procedure MI-85.6, dated February 1986. The applicant did refer to Molykote BR-2 in paragraph 5.1.10 of the same procedure. This is a potential deviation for calling out in a maintenance procedure an old lubricant which had been superseded by a new lubricant. The inspector noted that MI-85.6 was ran for the first time at WBN during the inspector's ATWS inspection visit, and concluded that the applicant lacks experience in the maintenance of reactor trip breakers.



NSSP-NV-609  
March 5, 1986

P. M. Chan  
LLNL/NRC  
Page 16

5. CONCLUSIONS

Within the areas examined, viz. Vendor Interface and Manual Control and Post-Maintenance Testing, the inspector concluded that there are no adverse findings.