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**NOV 30 1993**

U.S. Nuclear Regulatory Commission  
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Gentlemen:

In the Matter of the Application of ) Docket Nos. 50-390  
Tennessee Valley Authority ) 50-391

WATTS BAR NUCLEAR PLANT (WBN) - NRC INSPECTION REPORT NOS. 390, 391/93-59 -  
REPLY TO NOTICE OF VIOLATIONS AND ADDITIONAL INFORMATION REGARDING VALVE  
SAMPLING METHODOLOGY FOR QA RECORDS CAP

This letter provides TVA's response to the subject inspection report dated  
October 25, 1993, which proposed two violations related to inadequate  
installation documentation for Unit 1 pressurizer PORVs and inadequate  
corrective action related to a Westinghouse technical bulletin. TVA's  
response to these violations is provided in Enclosure 1.

The subject inspection report also requested TVA to provide an assessment of  
the adequacy of the sampling of safety significant valves during the records  
review associated with the QA Records CAP. TVA's assessment is provided in  
Enclosure 2.

A list of commitments made in this letter is provided in Enclosure 3.

An extension of the due date for this submittal was discussed with NRC Region  
II staff. If you should have any questions, contact P. L. Pace at (615)-365-  
1824.

Very truly yours,

William J. Museler

Enclosures  
cc: See page 2

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U.S. Nuclear Regulatory Commission  
Page 2

NOV 30 1993

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ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2  
REPLY TO NRC LETTER OF OCTOBER 25, 1993  
NRC VIOLATIONS 50-390,391/93-59-01 AND 50-390,391/93-59-02

VIOLATION 50-390,391/93-59-01

10 CFR 50, Appendix B, Criterion XVII, Quality Assurance Records, requires, in part, that, "Sufficient records shall be maintained to furnish evidence of activities affecting quality. The records shall include at least the following: Operating logs and the results of reviews, inspections, tests, audits, monitoring of work performance, and materials analyses. The records shall also include closely related data such as qualifications of personnel, procedures, and equipment. Inspection and test records shall, as a minimum, identify the inspector or data recorder, the type of observation, the results, the acceptability, and the action taken in connection with any deficiencies noted. Records shall be identifiable and retrievable."

Nuclear Quality Assurance Plan, TVA-NQA-PLN89-A, Rev. 3, Section 6.3.2, QA Records Program Elements, requires, in part, that, "Sufficient records and documentation shall be prepared and maintained to provide evidence of the quality of items or activities affecting quality. QA records shall be legible, complete, and identifiable to the item involved."

Contrary to the above, the inspection records, which were prepared to document the installation of the Unit 1 Pressurizer Power Operated Relief Valves, did not adequately furnish evidence of activities affecting quality in that the records for each of these valves did not correctly reflect the vendor valve serial number stamped on the body of each of the valves. The incorrect records included the Flange Bolt Operation Sheets (QCP-1.42-1, Test Card 2), Initial Valve Installation Inspection (QCP-4.10-9, Test Card 70) and ASME N-5 Code Data Reports.

This is a Severity Level IV Violation (Supplement II).

RESPONSE TO VIOLATION 390,391/93-59-01

Reason for the Violation

The reason for the violation was failure of an inspector to follow an inspection procedure. WBNP-QCP-4.10-9, "Valve Installation Inspection," provides the inspection and documentation requirements for valve installations and requires that the serial number be verified from the ASME nameplate or, as an alternative, installation documentation associated with the valve be reviewed to ensure that positive identification and traceability of the valve to its specific location and applicable data report is maintained. Contrary to the procedure, the inspector recorded the serial numbers for valves 1-PCV-68-334 and 1-PCV-68-340 from metal tags attached to the valve operators. These tags were not official tags and, at some point during the installation process, the tag indicating serial number 5 became attached to the operator for the valve which was stamped with serial number 6 and the tag indicating serial number 6 became attached to the valve which was stamped with serial number 5. Likewise, the 2-PCV-68-334 tag attached to the operator for 1-PCV-68-340 is an unofficial tag and should not have been used to verify the identification of 1-PCV-68-340. No evidence was found that this tag has been used for valve identification purposes.

The above inspection error also resulted in recording the incorrect serial numbers on the N-5 Code Data Reports, since the information for these reports is taken from the installation records.

Regarding the flange bolting operation sheets, the serial number of the component to be inspected is entered on the record by the responsible engineer for information only. Verification of this serial number is not part of the acceptance criteria for the flange bolting operation and would not have been verified by the inspector. The responsible engineer most probably recorded these serial numbers from the incorrect tags attached to the valve operators.

#### Corrective Steps Taken and Results Achieved

Tagging requests have been issued to remove all tags, with the exception of the official TVA valve identification tags, from valves 1-PCV-68-334 and 1-PCV-68-340.

The N-5 Code Data Reports have been revised to correct the serial numbers associated with valves 1-PCV-68-334 and 1-PCV-68-340.

The valve installation inspection records for 1-PCV-68-334 and 1-PCV-68-340 have been supplemented to reflect the correct serial numbers.

#### Corrective Steps That Will Be Taken To Avoid Further Violations

An investigation is being conducted to document similar conditions relating to inspection records for other installed Unit 1 ASME valves. This investigation is being conducted via a statistical sampling program described in a site quality assurance instruction. WBN expects to complete the investigation in March, 1994. Corrective actions from this investigation will be accomplished in accordance with WBN's corrective action program.

#### Date When Full Compliance Will Be Achieved

WBN will be in full compliance upon completion of any corrective actions determined necessary from the investigation described above. The investigation is expected to be complete in March, 1994. Any necessary corrective actions associated with the investigation will be complete prior to fuel load of Unit 1.

#### VIOLATION 50-390,391/93-59-02

10 CFR 50, Appendix B, Criterion XVI, Corrective Action, requires, in part, that, "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected."

Nuclear Quality Assurance Plan, TVA-NQA-PLN89-A, Rev. 3, Section 10.1, Adverse Conditions, requires that, "Measures shall be established to ensure that items that do not conform to requirements are controlled to prevent their inadvertent installation or use. Adverse conditions, including nonconforming items or non hardware problems such as failure to comply with operating license, technical specifications, or procedures, shall be identified, evaluated, corrected, tracked, trended, and when required, reported to appropriate levels of management. Procedures or instructions implementing the corrective action program shall establish the criteria for documenting and tracking adverse conditions."

Contrary to the above, adequate measures to assure that conditions adverse to quality were not promptly identified, corrected and documented in that no instructions were issued to correct a bolting problem identified on Westinghouse Technical Bulletin NSID-TB-86-07 for the Centrifugal Charging and Safety Injection Pumps following issuance of the bulletin in 1987, even though corrective action was necessary as evidenced by licensee memorandum RIMS # L22870710800 dated July 10, 1987. Additionally, corrective action to replace the defective bolts addressed in the bulletin on the Centrifugal Charging Pumps was initiated in August, 1993, approximately seven years after bulletin issuance, only after maintenance problems concerning the bolting caused the problem to become self revealing. In addition, no action concerning the bulletin was initiated regarding the Safety Injection Pumps, following rediscovery of the existence of the bulletin after the maintenance problem on the Centrifugal Charging Pumps, until the issue was raised by the NRC inspection team in September, 1993.

This is a Severity Level IV Violation (Supplement II).

RESPONSE TO VIOLATION 390,391/93-59-02

Denial of the Violation

TVA denies the violation.

Reason For the Denial

WBN does not concur that a condition adverse to quality existed for the hold down bolting for the centrifugal charging pumps and safety injection pumps.

Charging Pumps

In response to a discussion in an NRC exit interview on May 3, 1985, TVA evaluated the unmarked hold down bolting associated with vendor-supplied, skid-mounted equipment and other bolted components. This evaluation included the centrifugal charging pumps and concluded that the subject bolts were Grade A325, which were acceptable for this application.

Westinghouse Technical Bulletin NSID-TB-86-07 was issued in September, 1986. This bulletin stated that, based on sample calculations and review of a substantial number of pump seismic analyses, Westinghouse had concluded that SAE Grade 2 (unmarked) or equivalent bolting was adequate to withstand torque loads typical for auxiliary pumps and use of SAE Grade 2 or equivalent hold down bolting did not affect the operability of the pump assemblies and did not present a potential safety issue.

Since WBN had determined in 1985 that the centrifugal charging pump hold down bolting was Grade A325, no actions were required in accordance with the Westinghouse technical bulletin for these pumps. Accordingly, no adverse condition existed and no permanent records were required.

Safety Injection Pumps

Although the evaluation discussed above generically drew the conclusion that unmarked bolting was acceptable at WBN due to vendor and TVA quality programs, no specific documentation dispositioning safety injection pump hold down bolting was located.

As a result of the NRC's recent review of this issue, a work request was initiated in August, 1993, to check the hold down bolting material for the safety injection pumps. This investigation determined that the hold down bolts for the safety injection pumps are marked as SAE Grade 5. A search of the maintenance history for the pumps did not indicate that these bolts have ever been replaced and no evidence exists that these are other than the originally supplied bolts. Since these bolts have been determined to be better than SAE Grade 2, no actions were required in accordance with the Westinghouse technical bulletin. Though TVA has not been able to locate any documents specifically dispositioning the safety injection bolts as acceptable, this does not constitute a failure to identify, correct, or document a problem since permanent records were not required to document an acceptable condition addressed in a technical bulletin.

#### Additional Information

Based on the 1985 investigation of the centrifugal charging pump hold down bolts and the recent investigation of the safety injection pump hold down bolts, the conclusion to replace the bolting by the WBN Mechanical Maintenance Section discussed in TVA's July 10, 1987, memo should be viewed as a suggested enhancement instead of a required corrective action. This memo documented TVA's review of the Westinghouse technical bulletin and NRC IE Information Notice 86-025.

The recent decision to replace the hold down bolts on the centrifugal charging pumps reflected a conservative decision by the maintenance department after a hold down bolt on the auxiliary oil pump on the centrifugal charging pump skid broke while it was being loosened to accomplish a maintenance activity. TVA's conservative decision to replace the hold down bolts should not be cited as evidence that the matter was not properly dispositioned earlier.

#### Current Practices

Since 1989, WBN has had a staff of personnel in place specifically dedicated to assuring these types of issues were properly addressed and documented for WBN. Under TVA's current practice, vendor documentation, such as Westinghouse technical bulletins, fall within the Nuclear Experience Review (NER) program, as described in TVA Standard 4.4 and WBN Site Standard Practice 4.04. These procedures describe a process by which a dedicated staff reviews and tracks to completion those actions necessary to address vendor issues. Formal closure documentation is provided to incorporate NER with a copy sent to TVA's Records Information Management System (RIMS) for lifetime storage.

ENCLOSURE 2  
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2  
ASSESSMENT OF ASRR VALVE SAMPLING METHODOLOGY  
UNRESOLVED ITEM 390,391/93-59-06

DISCUSSION

WBN's comprehensive recovery efforts involve the implementation of corrective actions pursuant to numerous programs, including several that are defined in Corrective Action Programs (CAPs) and Special Programs (SPs). Among the CAPs and SPs are several which deal with actions necessary to correct hardware and related design document deficiencies. Many of these programs involve activities necessary to evaluate the adequacy of hardware relative to current design requirements.

The QA Records CAP was established at WBN initially because a number of adverse condition reports (NCRs, CAQRs, DRs, etc.) had identified a number of records-related problems. These adverse condition reports identified problems with the storage, retrievability, and quality of records and involved a cross-section of records and types of hardware. The largest category of problems was retrievability, while the record quality problems were mainly administrative in nature. The original version of the QA Records CAP was established to evaluate and resolve these identified problems.

As the QA Records CAP was implemented, the need became apparent to perform a systematic review of all record types applicable to WBN. This was necessary to assure that the extent of the condition for the previously identified problems was adequately performed and that any additional problems with WBN records were also identified and resolved.

The methodology used to carry out this systematic review was established to achieve the following objectives:

1. Provide broad coverage of record types applicable to WBN using established licensing requirements; i.e., ANSI N45.2.9.
2. Provide a means to review a sample of records of each type that are representative of the total record population applicable to WBN. In order to assure this was accomplished, the sample of records selected for review from each type was not biased, with two exceptions.
  - a. Sampling was directed to provide a set of records from each hardware element for which a record type is applicable.
  - b. Sampling was done in a way to assure that more safety-related items were reviewed than quality-related items.

These objectives and methodologies were selected due, in large part, to the fact that record problems had not been prioritized according to either the severity of the problem or the significance of the record or hardware to which it applied.

Random sampling based on "classical" statistics and used to select components and records of given populations was accepted by the NRC as an appropriate method to provide reasonable confidence in the adequacy of the WBN QA Records. (NRC letter to TVA dated June 9, 1992.)

The NRC's recent questions about the adequacy of sampling used to select valves concern the relative number of "important" safety related valves selected for review versus the number of valves with "marginal safety significance." This has been identified as Unresolved Item 390,391/93-59-06.

In order to address NRC's questions, TVA has defined the following two classifications of safety related valves:

Vital - Those valves which perform important accident mitigation functions (e.g., containment isolation, auxiliary feed water flow, safety injection flow) in addition to the normal pressure retention function associated with the valve being classified as safety-related. These valves are generally active type valves which are required to operate to perform safety functions.

Non-Vital - Safety-related valves which do not perform a vital function (e.g., root valves, isolation valves). These valves are generally passive type valves.

There are approximately 16,000 valves installed for WBN Unit 1. Of these, approximately 400 (2.5%) are considered vital. There are more types of records that apply to vital valves than to non-vital valves since their size and ASME classification require additional NDE during manufacturing. Also, since these valves are often motor or pneumatically operated, there are additional performance testing requirements by the vendor and the installation often requires additional work operations and related records to connect cables, raceways, instrument lines, air lines, and additional structural supports.

The additional types of records covering the features that distinguish vital valves from non-vital valves have been reviewed using samples selected by the methods established in the ASRR program. In many cases the additional records are sampled under different element categories, including cables, raceways, instruments, instrument lines, etc. Figure 1 shows a typical active (vital) valve installation with the additional elements and record types that apply.

For those record types which are common to both vital and non-vital valves, the quality of individual records within each type are expected to be the same irrespective of the valve classification since the procedures involved in generating records for both types of valves were the same. Also, the same personnel performed the work and generated the records. Based on the above, the quality of the records for either valve classification can be judged using a sample randomly drawn from the two combined populations for each common record type.

Since some types of records do not exist for non-vital valves, the ASRR sample could only be drawn from the vital valve population. This is the case for certain manufacturer's NDE records and performance test records. The result is that a high number of records which pertain to vital valves have been reviewed by TVA in order to satisfy the requirements of the approved ASRR program for sampling each ANSI record type.

Table I indicates the sample sizes by ANSI record type and valve classification.

## RESULTS OF THE TVA ASRR REVIEWS

- No design significant problems were found related to valve records (either vital or non-vital) during TVA ASRR reviews, or NRC reviews of numerous records associated with 15 vital valves.
- Initial indications that few problems existed with valve records were confirmed through ASRR reviews. Most problems found were related to non-vital valve records. Problems identified with other element records, such as missing CMTRs and radiographs, result in extent of condition evaluations which include both vital and non-vital valves. Appropriate corrective actions are being taken to address these deficiencies with vital and non-vital valve records.
- Several other programs underway at WBN are generating additional records to provide evidence of the acceptability of vital valves. These programs include hydrostatic tests, MOVATS, and preoperational testing.

## CONCLUSIONS

- TVA is implementing the methodology for sampling QA records prescribed in the approved QA Records CAP.
- TVA has reviewed an adequate number of record types which are applicable to the manufacture and installation of vital valves.
- Based upon the results to date, TVA has established adequate confidence that WBN QA records (both for vital and non-vital valves) conform to applicable requirements or will conform after completion of identified corrective actions.

TABLE I  
NUMBER OF RECORDS REVIEWED FOR VALVES

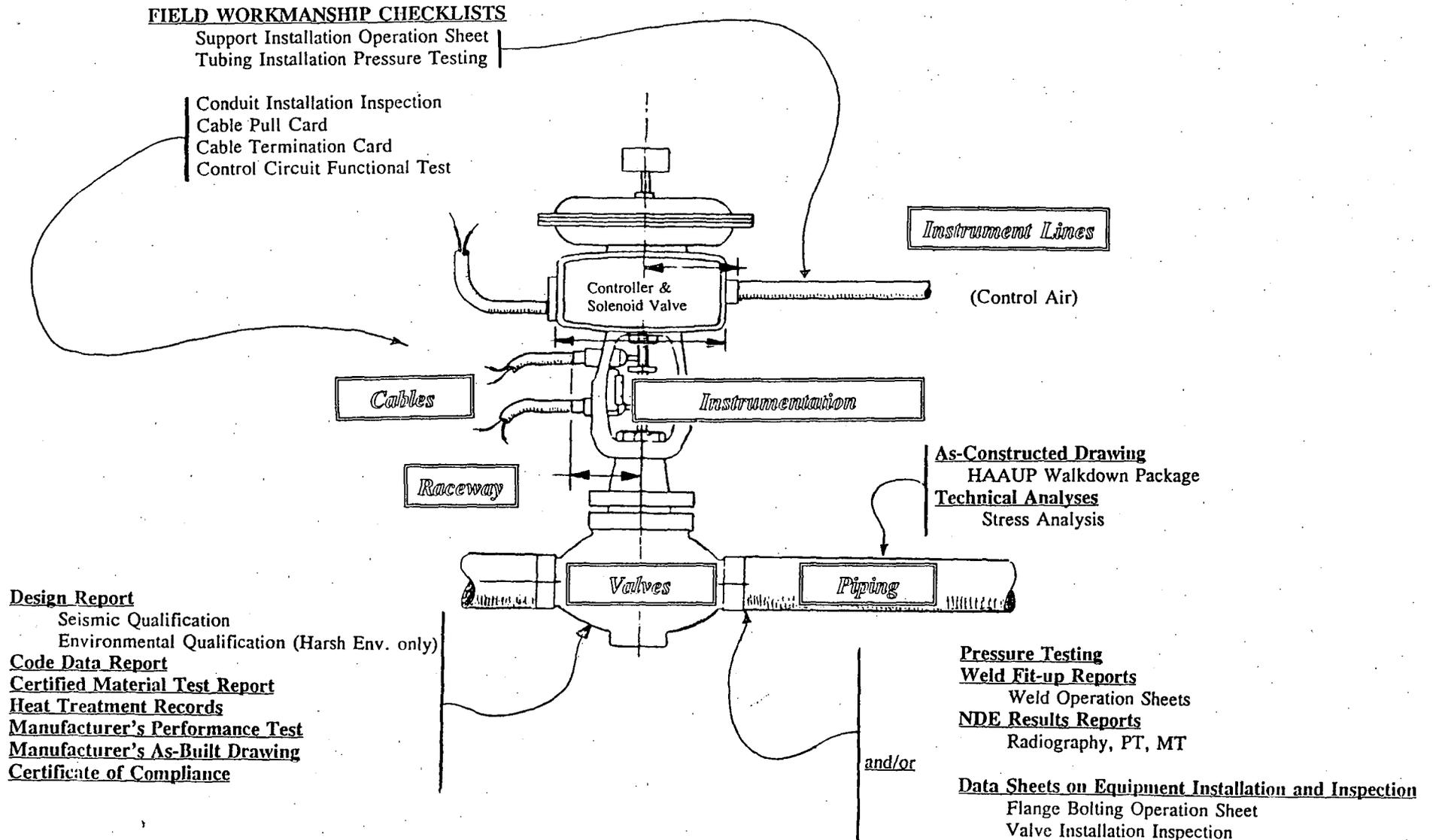
ANSI RECORD TYPE	NON-ACTIVE VALVES (Approximately 16,000 Valves)	ACTIVE VALVES (Approximately 400 Valves)
<b>DESIGN</b>		
A01 Codes and Standards	2	
A02 As Constructed Drawings	44	3 (7)
A03 Calculations	3	1 (2)
A07 Des Repts (Des Chg Repts)	6	3 (1)
A08 Design Review Reports	35	1
A12 Reports of Eng Surveill	7	
A16 Sys Process & Instr Diag	75	3 (95)
A17 Tech Analysis, Eval, Repts	5	1
<b>INSTALLATION</b>		
D03 Inspectors Certifications	6	(1)
D06 Inspection Reports	57	4 (122)
G03 Receipt Inspection Reports	8	(11)
<b>MANUFACTURING</b>		
J01 Applicable Code Data Rep	29	4 (21)
J02 As-Built Drawings	5	2
J04 Certificates of Compliance	1	(6)
J12 Heat Treatment Records	39	2 (9)
J15 Liquid Penetrant Exam	29	(21)
J18 Magnetic Particle Exam	2	1
J21 Material Property Reports	76	8 (64)
J24 Performance Test Results	N/A	16 (5)
J27 Pressure Test Results	29	3 (6)
J33 Radiographic Review	N/A	21* (7)
J34 UT Final Results	N/A	4 (5)
J39 Welding Procedures	22	
<b>PROCUREMENT</b>		
N03 Procurement Specification	5	
N04 Purchase Order	8	(3)

5 MSRVs are on order to complete EOC. Records provided to NRC. ( ) ↑

Table does not indicate records reviewed by TVA for other elements related to vital valves.

# TYPICAL DESIGN AND INSTALLATION RECORDS

## Air-Operated Valve



ENCLOSURE 3  
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2  
LIST OF COMMITMENTS

1. Conduct an investigation to determine if conditions similar to those described in NOV 390,391/93-59-01 relating to inspection records exist for other installed Unit 1 ASME valves by March 31, 1994.
2. Complete any corrective actions determined necessary from the investigation conducted to determine if conditions similar to those described in NOV 390,391/93-59-01 relating to inspection records by fuel load of Unit 1.